



EN

Horizon Europe
Work Programme 2023-2024

*9. Food, Bioeconomy, Natural Resources, Agriculture and
Environment*

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Introduction

The Horizon Europe mandate for Cluster 6 is to provide opportunities to strengthen and balance environmental, social and economic goals and to set human economic activities on a path towards sustainability. Therefore, the underlying paradigm of Cluster 6 is the need for a transformative change of the EU economy and society to reduce environmental degradation, halt and reverse the decline of biodiversity and better manage natural resources while meeting the EU's climate objectives and ensuring food and water security. It takes into account the evolving geopolitical context and the new research and innovation priorities focused on further strengthening the EU's open strategic autonomy in particular in the energy and food sectors.

Research and innovation (R&I) in this cluster will help meet to the long-term priority objectives to 2030 set out in the 8th Environment Action Programme¹. In particular it will ensure that policy action is firmly anchored in **latest science and knowledge**. It will therefore contribute to the UN's Sustainable Development Goals (SDGs)² and accelerate the ecological transition required by the European Green Deal³. Of particular relevance will be: i) SDG 2 – zero hunger; ii) SDG 3 – good health and well-being; iii) SDG 6 – clean water and sanitation; iv) SDG 8 – decent work and economic growth; v) SDG 9 – industry, innovation, and infrastructure; vi) SDG 11 – sustainable cities and communities; vii) SDG 12 - responsible consumption and production; viii) SDG 13 – climate action, ix) SDG 14 – life below water and x) SDG 15 – life on land".

This cluster will also contribute to achieving the target of dedicating 7,5% of the MFF 2021-2027 to biodiversity as of 2024, and 10% in 2026 and 2027.

Activities in this work programme will contribute to all Key Strategic Orientations (KSOs) of the Strategic Plan⁴, with orientations B and C contributing the most directly. These KSOs are:

1. promoting an open strategic autonomy by leading the development of key digital and enabling technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations;
2. restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment;
3. making Europe the first digitally led circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems;

¹ https://ec.europa.eu/environment/strategy/environment-action-programme-2030_en.

² [THE 17 GOALS | Sustainable Development \(un.org\)](https://www.un.org/sustainabledevelopment/).

³ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁴ <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/3c6ffd74-8ac3-11eb-b85c-01aa75ed71a1>.

4. creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.

To contribute to these programme-level KSOs, Cluster 6 will deliver on six specific expected impacts. In this work programme, each expected impact has been transformed into one or two specific destination(s) (see table below). This destination-based work programme structure follows a thematic centre-of-gravity approach, but activities in a given destination may be of a cross-cutting nature and will often contribute to several expected impacts. The specific contribution to the overall expected impacts is explained in the introductory text of each destination.

Expected impact (strategic plan)	Destination (Cluster 6 work programme)
Climate neutrality is achieved by reducing Green House Gas (GHG) emissions, maintaining natural carbon sinks, and enhancing the sequestration and storage of carbon in ecosystems, including by unfolding the potential of nature-based solutions, production systems on land and at sea as well as rural and coastal areas, where adaptations to climate change are also being fostered for enhancing resilience	Land, oceans and water for climate action
Biodiversity is back on a path to recovery, and ecosystems and their services are preserved and sustainably restored on land, inland water and at sea through improved knowledge and innovation	Biodiversity and ecosystem services
Sustainable and circular management and use of natural resources as well as prevention and removal of pollution are mainstreamed, unlocking the potential of the bioeconomy, ensuring competitiveness and guaranteeing healthy soil, air, fresh and marine water for all, through better understanding of planetary boundaries and deployment of innovative technologies and other solutions, notably in primary production, forestry and bio-based systems	Circular economy and bioeconomy sectors Clean environment and zero pollution
Food and nutrition security for all within planetary boundaries is ensured through knowledge, innovation and digitalisation in agriculture, fisheries, aquaculture and food systems, which are sustainable, resilient, inclusive, safe and healthy from farm to fork.	Fair, healthy and environmentally friendly food systems from primary production to consumption
Rural, coastal and urban areas are developed in a sustainable, balanced and inclusive manner thanks to a better understanding of the environmental, socio-economic,	Resilient, inclusive, healthy and green rural, coastal and urban communities

behavioural and demographic drivers of change as well as deployment of digital, social and community-led innovations	
Innovative governance models enabling sustainability and resilience are established and monitored through enhanced and shared use of new knowledge, tools, foresight, and environmental observations as well as digital, modelling and forecasting capabilities	Innovative governance, environmental observations and digital solutions in support of the Green Deal

Activities under Cluster 6 will support the new innovation agenda for Europe and help accelerate the ecological transition required by the European Green Deal⁵ in order to achieve climate neutrality by 2050. This will be done by preserving Earth’s natural carbon sinks and stocks in ecosystems, including soils and plants, forests, farmed lands and wetlands and the marine environment. This will substantially reduce GHGs from the forestry and agricultural sectors and transform the food system. In addition, activities will foster innovation to develop the circular economy and exploit the potential of biological resources for renewable products. This will reduce the EU’s dependence on non-renewable resources and help reduce emissions/waste from industrial processes by using more sustainable bio-based systems. At the same time, it will avoid trade-offs that could damage biodiversity and will promote synergistic measures to protect biodiversity. In addition to the EU’s climate policy, R&I will support the objectives of:

- the EU biodiversity strategy for 2030⁶;
- the EU’s new circular economy action plan⁷;
- the EU action plan “Towards a Zero Pollution for Air, Water and Soil⁸ (‘the EU zero pollution action plan’);
- the EU industrial strategy;
- the bioeconomy strategy;
- the EU forest strategy;
- the EU soil strategy for 2030⁹
- the sustainable blue economy strategy;
- the chemicals strategy for sustainability; and
- the EU plastics strategy.

⁵ [A European Green Deal | European Commission \(europa.eu\).](https://ec.europa.eu/euro-observatory/en/observatory/2023/01/a-european-green-deal)

⁶ [EUR-Lex - 52020DC0380 - EN - EUR-Lex \(europa.eu\).](https://eur-lex.europa.eu/eli/reg/2020/1043/oj)

⁷ [EUR-Lex - 52020DC0098 - EN - EUR-Lex \(europa.eu\).](https://eur-lex.europa.eu/eli/reg/2020/1043/oj)

⁸ [EUR-Lex - 52021DC0400 - EN - EUR-Lex \(europa.eu\).](https://eur-lex.europa.eu/eli/reg/2021/1056/oj)

⁹ [EUR-Lex - 52021SC0323 - EN - EUR-Lex \(europa.eu\).](https://eur-lex.europa.eu/eli/reg/2021/1056/oj)

Protecting and restoring the integrity of ecosystems and their capacity to deliver a wide range of essential services, therefore putting Europe's biodiversity on a path to recovery by 2030, as required by the EU biodiversity strategy for 2030, is fundamental to achieving the European Green Deal objectives. Avoiding loss of biodiversity (from genes to species and ecosystems) could also help avoid threats to human health in the future. R&I will address challenges in this area, including by enabling transformative changes. This cluster will i) improve knowledge about the causes of biodiversity decline, the role of ecosystems and their services and ii) support their restoration. This cluster deals with i) agriculture, ii) forestry, iii) aquaculture and fisheries, iv) food and bio-based systems, and v) animal and human health, which all directly depend on ecosystem services. These sectors have profound environmental impacts and are also particularly affected by the global environmental changes. In particular climate adaptation and biodiversity needs will have to be considered for their transformation. R&I activities will include solutions addressing indirect drivers of biodiversity loss, which also affect the climate and our resilience to adapt to it.

Cluster 6 will steer and accelerate the transition to sustainable, healthy and inclusive food systems to effectively achieve the objectives of the farm to fork strategy. It will empower farmers, fishers and aquaculture producers to transform their production methods more quickly and efficiently and make the best use of nature-based, technological, digital and social innovations. This will deliver better climate mitigation and environmental results, increase climate resilience and reduce dependency on pesticides and antimicrobials. Furthermore it will also provide consumers with affordable, safe, nutritious, healthy and sustainable food. R&I will also stimulate i) practices at all stages of the food system from production to processing, ii) services, iii) the use and valorisation of waste and by-products and iv) surplus management. This will ensure safe and sustainable food and enable a shift to sustainable and healthy diets. R&I will also support the design, implementation and monitoring of the new common agricultural policy (CAP), the common fisheries policy (CFP) and the EU General Food Law.

Improved knowledge and innovations will be key to achieving the zero-pollution ambition of the European Green Deal to halt and prevent pollution, by addressing issues concerning fresh and marine waters, soils, nutrients as well as the environmental performance of processes. R&I will support EU environmental legislation and policies that target a higher level of protection for biodiversity, soil, water, air and marine resources, including i) the Birds Directive¹⁰ and the Habitats Directive¹¹, ii) the EU pollinators initiative¹², iii) the EU Water Framework Directive¹³, iv) the EU maritime policy and v) the EU Arctic policy.

The cluster will help develop resilient and vibrant rural, coastal, urban, and peri-urban areas in line with the Commission priority 'An economy that works for people' and the long-term vision for rural areas. It will help achieve thriving rural innovation ecosystems by supporting and/or establishing synergetic initiatives such as living labs, smart villages, start-up villages,

¹⁰ [EUR-Lex - 32009L0147 - EN - EUR-Lex \(europa.eu\).](#)

¹¹ [EUR-Lex - 31992L0043 - EN - EUR-Lex \(europa.eu\).](#)

¹² [EUR-Lex - 52018DC0395 - EN - EUR-Lex \(europa.eu\).](#)

¹³ [EUR-Lex - 32000L0060 - EN - EUR-Lex \(europa.eu\).](#)

EIP-AGRI operational groups and an S3 platform. It will develop new governance models to implement the European Green Deal initiatives, needed to ensure a fair and just transition and that no one is left behind. This cluster will help in the use, uptake and deployment of environmental observations and take advantage of digital solutions in line with the EU priority ‘A Europe fit for the digital age’. The cluster will also take advantage of opportunities that the post-COVID-19 crisis recovery package offers to set the economy on a path to sustainable development in line with the UN 2030 Agenda.

To be more effective in achieving a positive impact, the proposals should be synergise with relevant initiatives funded at EU level, including the Knowledge and Innovation Communities (KICs) of the European Institute of Innovation and Technology (EIT). In particular, the innovation ecosystems created and nurtured by the EIT KICs can help build communities or platforms for coordination and support actions, sharing knowledge or disseminating and making best use of the project results. Where relevant those who draft proposals are encouraged to explore possible forms and means of service provisions distinct to the EIT KICs, in particular EIT Food and EIT Climate-KIC.

Furthermore, Horizon Europe is the R&I support programme in a system of European and national funding programmes that shares policy objectives. Through the programme, special attention will be given to ensuring cooperation between universities, scientific communities and industry, including small and medium-sized enterprises, and people and their representatives. This is in order to bridge gaps between genders, territories, generations and regional cultures, in particular to support women innovators and care for the needs of young people in shaping Europe’s future. Calls could take the form of EU synergy calls, meaning that projects that have been awarded a grant under the call could also receive funding under other EU programmes, including relevant shared management funds. In this context, project proposers should consider and actively seek synergies with, and, where appropriate, possibilities for further funding from:

- other R&I-relevant EU, national or regional programmes (such as the European Regional Development Fund (ERDF));
- the European Social Fund Plus (ESF+);
- the Just Transition Fund (JTF);
- the European Maritime Fisheries and Aquaculture Fund (EMFAF);
- the European Agricultural Fund for Rural Development (EAFRD);
- InvestEU); and
- private funds or financial instruments.

The ERDF focuses among others things, on the development and strengthening of regional and local R&I ecosystems and smart economic transformation, in line with regional/national smart specialisation strategies. It can support investment in research infrastructure, activities

for applied research and innovation, including: i) industrial research, ii) experimental development and feasibility studies, iii) building research and innovation capacities; iv) uptake of advanced technologies and v) roll-out of innovative solutions from the Framework Programmes for research and innovation through the ERDF.

Throughout this work programme, synergies are also sought with the work of the European Space Agency (ESA), to ensure complementarity and mutual benefits regarding R&I actions conducted by ESA as well as actions within this cluster and Clusters 3, 4 and 5. Such synergies are also sought in order to contribute to the European Commission-ESA Earth System Science initiative. In this cluster this will be achieved – by bringing major ESA space information and science into Horizon Europe research projects to support significant breakthrough in food, bioeconomy, natural resources, agriculture and environment research. The collaboration with ESA is planned to be implemented in a proactive manner especially within 4 topics of this cluster through Destinations 1, 5, and 7. Collaboration with ESA is also encouraged within other topics of this work programme.

The EU's Recovery and Resilience Facility (RRF) currently available in all Member States aims to finance projects that directly tackle the economic and social impacts of the COVID-19 crisis and support the green and digital transitions. For project ideas that directly help meet these objectives it is advisable to check access to the RRF for fast and targeted support.

Research on a societal and political framework is necessary to achieve the transformation expected and R&I investments under Cluster 6 will therefore emphasise the role of the social sciences and humanities, gender, inter/transdisciplinary and systems approaches. R&I will build on existing research infrastructures.

The topics on food in this work programme are also the results of the work carried out in a project funded through the Horizon 2020 European Green Deal call, Other Action “9. Support to the engagement of European Citizens in the transition to the European Green Deal (EGD)”. During this project the European Commission consulted the public, civil society representatives, research and education communities as well as national authorities through a series of engagement events across the 27 Member States to develop an EU roadmap for the climate transition.

Cluster 6 activities will sustain the EU's ambition in international fora in areas of paramount importance such as biodiversity, climate change, the management of natural resources, seas and ocean, zero pollution, sustainable agriculture, food safety and food and nutrition security. In line with the EU's global approach to research and innovation, the 2023-2024 work programme will remain almost completely open to non-associated third countries, so that they can participate in all topics. In support of the global gateway strategy, projects involving international partners should lead to increased scientific knowledge and transfer of technology among partner countries, enabling global challenges across the world to be addressed and sustainable growth and jobs to be created. Cooperation should take place in a value-based way, creating linkages, not dependencies. Legal entities established in China are not eligible to participate in Innovation Actions in any capacity. Please refer to the Annex B of the General Annexes of this Work Programme for further details.

For topics in this cluster, the consortia should consider their possible contribution to Joint Research Centre (JRC) relevant platforms for i) capitalising on the knowledge developed in their projects, and ii) becoming more policy relevant, contributing in terms of data, indicators and knowledge. For instance:

- Life Cycle Assessment (LCA) and its relevant application to value chain assessment, with reference to the European Platform on Life Cycle Assessment (EPLCA, <https://eplca.jrc.ec.europa.eu/>) and make reference to the Environmental footprint method when applying LCA (<https://ec.europa.eu/environment/eussd/smgp/index.htm>);
- raw materials, with reference to the Raw Materials Information System (RMIS, <https://rmis.jrc.ec.europa.eu/>);
- soil and soil related issues, with reference to the European Soil Observatory (ESO, <https://ec.europa.eu/jrc/en/eu-soil-observatory>);
- natural capital accounting, with reference to the Integrated Natural Capital Accounting (INCA) platform (<https://ecosystem-accounts.jrc.ec.europa.eu>);
- biodiversity, with reference to the EC Knowledge Centre for Biodiversity, (https://knowledge4policy.ec.europa.eu/biodiversity_en);
- food systems and food security, with reference to the EC Knowledge Centre for Global Food and Nutrition Security (https://knowledge4policy.ec.europa.eu/global-food-nutrition-security_en);
- bioeconomy, with reference to the EC Knowledge Centre for Bioeconomy (https://knowledge4policy.ec.europa.eu/bioeconomy_en);
- EU and African Union (AU) cooperation, with reference to the Africa Knowledge Platform (<https://africa-knowledge-platform.ec.europa.eu>);
- Earth and environmental observations, with reference to the EC Knowledge Centre on Earth Observation (https://knowledge4policy.ec.europa.eu/earthobservation_en).

Specific requirements for multi-actor projects:

Proposals submitted for topics, which include a request to follow the multi-actor approach must meet all of the requirements below. The multi-actor approach described here - a form of responsible R&I, aims to make the R&I process and its outcomes more reliable, demand-driven, shared and relevant to society. It also aims to have these outcomes shared more extensively. This entails more than just widely disseminating a project's results, or listening to the views of a board of stakeholders. A multi-actor project ensures the genuine and sufficient involvement of a targeted array of actors, which serves the objectives of the topic. These actors include: i) researchers, ii) farmers / farmers' groups and associations, iii) foresters / foresters' groups and associations, iv) aquaculture producers, v) fishers / fishers' groups and associations, vi) advisors, vii) food and bioeconomy businesses, viii) other businesses, ix)

consumer associations, x) local communities, xi) citizens, xii) civil society organisations including NGOs, and xiii) government representatives. Which key actors are relevant to participate depends on the objective of the proposal. They are essentially the (end-) **users**¹⁴ **of the project results** who are backed up by any other useful intermediaries and actors who can contribute with further expertise and innovative ideas relevant to the topic's objectives, and support communication and dissemination. The genuine and sufficient involvement of such actors should take place **all over the whole course of the project**: from participation in development of the project idea, planning and experiments to implementation, communication and dissemination of results and to a possible demonstration phase. Building blocks for the project proposal are expected to come from science as well as from practice: it is a 'co-creation' process. Practitioners and (end) users are to be involved, not as a study-object, but to use their practical and local knowledge and/or entrepreneurial skills to develop solutions and create 'co-ownership' of results for (end-) users and practitioners. This will contribute to and speed up the acceptability and uptake of new ideas, approaches and solutions developed in the project.

Therefore, a **multi-actor project proposal must include the following elements**:

- It must demonstrate how the proposed objectives and planning are targeting the needs/problems/challenges of and opportunities for the (end-)users of the project results;
- It must demonstrate how the description of the project concept and in particular the composition of the consortium reflects a balanced choice of relevant key actors who have complementary types of knowledge (scientific, practical, etc.), and must ensure that project results which should be ready for practice are broadly implemented;
- It must demonstrate how the project intends to use existing practices and tacit knowledge. This should be illustrated in the proposal with a sufficient number of high-quality knowledge exchange activities outlining the precise and active roles of the different non-scientific actors in the work. The cross-fertilisation of skills, competencies and ideas between actors should generate innovative findings and solutions that are more likely to be applied on a wide scale;
- It must demonstrate how the project will facilitate the multi-actor engagement process by making use of the most appropriate methods and expertise;
- It must demonstrate the project's added value: how it will complement existing research and best practices;
- It must demonstrate how the project will result in practical and ready to use knowledge, approaches, tools or products, that are easily understandable and freely accessible;
- It must demonstrate how these outputs ready for practice will feed into the existing dissemination channels most consulted by the (end-) users of the project results in countries and regions.

¹⁴ An "(end-) user" of project result is a person who is him/herself putting the project results into practice

In addition, to ensure EU-wide communication in all areas related to the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI)¹⁵ and the common agricultural policy (CAP) specific objectives¹⁶, in particular agriculture, forestry and rural development, this knowledge must also be summarised in an appropriate number of ‘practice abstracts’ in the common EIP-AGRI format¹⁷.

For areas falling outside the remit of EIP-AGRI and CAP specific objectives, other similarly effective solutions ensuring dissemination at EU level should be sought.

Where applicable, it is strongly recommended that interactive innovation groups, such as EIP-AGRI Operational Groups funded under Rural Development Programmes, become involved.

¹⁵ For the areas covered by the EIP-AGRI see section 8 (pp.8-9) of the Commission Communication 2012(79) final: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0079&from=EN>: Increased agricultural productivity, output, and resource efficiency, the bioeconomy, biodiversity, climate, ecosystem services and soil functionality, products and services for the integrated supply chain, and food quality, food safety and healthy lifestyles.

¹⁶ For areas covered by the CAP specific objectives see Article 6 of the Regulation (EU) 2021/2115 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2021.435.01.0001.01.ENG.

¹⁷ The EIP common format for "practice abstracts" is available at: <https://ec.europa.eu/eip/agriculture/en/eip-agri-common-format>.

Destination - Biodiversity and ecosystem services

The biodiversity and ecosystem services destination of the 2023-2024 Cluster 6 work programme will support R&I for the EU environment and biodiversity protection framework and the European Green Deal. It is based on the vision developed in the EU biodiversity strategy for 2030 and will support its implementation, furthering the orientations of the 2021-2022 work programme. It will also take into account new European Green Deal initiatives, notably i) the EU forest strategy for 2030¹⁸, ii) the EU action plan: “towards zero pollution for air, water and soil”, iii) the EU climate adaptation strategy and iv) the EU soil strategy for 2030. Connections are expected to be made with the EU proposal for a nature restoration law¹⁹, which includes binding targets, and environmental reporting, and the new approach for a sustainable blue economy in the EU²⁰.

It will support R&I activities that help maintain ecosystems in good ecological condition and a clean and healthy environment for the EU, including water, soil and air. This will contribute to the implementation of relevant policies such as health, climate adaptation and mitigation, disaster risk reduction, sustainable circular bioeconomy and blue economy. The R&I activities will also reflect the strong interconnections between, e.g. the EU biodiversity strategy for 2030²¹ and the farm to fork strategy²², as well as the pollinators initiative²³.

R&I supported under this destination will ensure that mainstreaming biodiversity in society and the economy takes into account justice, fairness and global aspects. This is to ensure the "just transition" emphasised in the European Green Deal is achieved.

R&I activities supported by Cluster 6 will complement and ensure synergies with activities supported under several Horizon Europe partnerships, in particular: i) the European biodiversity partnership Biodiversa+; ii) the European partnership water security for the planet “Water4All”; iii) the European partnership on accelerating farming systems transition: agroecology living labs and research infrastructures; iv) the European partnership on animal health and welfare and; v) the European partnership for a climate-neutral, sustainable and productive blue economy. R&I activities should also specifically address the strong interconnections between biodiversity and the emergence of infectious diseases by complementing the activities of with the European partnership for pandemic preparedness and the European Partnership for One Health/AMR Antimicrobial Resistance (AMR).

Synergies will also be ensured with the following Horizon Europe missions: “Restore our ocean, seas and waters by 2030”, “A soil deal for Europe” and “Adaptation to climate change”.

¹⁸ [Communication COM/2021/572: New EU Forest Strategy for 2030](#)

¹⁹ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

²⁰ [Communication COM/2021/240: on a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future](#)

²¹ Communication: EU Biodiversity Strategy for 2030

²² Communication: A farm to fork Strategy for a fair, healthy and environmentally-friendly food system

²³ https://ec.europa.eu/environment/nature/conservation/species/pollinators/policy_en.htm

Projects supported under this destination are expected, where appropriate, to provide timely scientific contributions to major science-policy bodies such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES)²⁴, the Intergovernmental Panel on Climate Change (IPCC), and the Convention on Biological Diversity. They are also expected to cooperate with the Science Service project Bio-agera. Where appropriate, the following existing platforms and information-sharing mechanisms should be used for dissemination and exploitation: the EC Knowledge Centre for Biodiversity²⁵, Biodiversity Information System for Europe (BISE)²⁶, and Oppla²⁷.

This destination will also help achieve the twin green and digital transitions. Where relevant, advantage will be taken of the development and use of advanced digital technologies.

This destination will continue to support the EU leadership in the relevant international fora in line with the Commission priority “A stronger Europe in the world” and international cooperation will be key to addressing global challenges in many topics in this destination. The EU's outermost regions (defined in article 349 TFEU), where biodiversity is high and threats multiply, should be given special consideration.

Expected impact

Proposals for topics under this destination should set out a credible pathway resulting in the strategic plan having the following impact: *"Biodiversity is back on a path to recovery, and ecosystems and their services are preserved and sustainably restored on land, inland water and at sea through improved knowledge and innovation"*. More specifically, one or more of the following impacts should materialise:

- **Direct drivers of biodiversity decline** will be understood and addressed – land and sea use change, natural resource use and exploitation, climate change, pollution, invasive alien species – as well as indirect drivers – demographic, socio-economic, technological, etc.
- **Protected areas** and their networks will be planned, managed and expanded and the status of species and habitats will be improved based on up-to-date knowledge and solutions.
- **Biodiversity, ecosystem services and natural capital will be mainstreamed in the society and economy**: e.g. they will be integrated into public and business decision-making; approaches for enabling transformative changes to tackle societal challenges will be built including by deploying nature-based solutions (NBS).
- **Practices in agriculture, forestry, fisheries and aquaculture will be developed and improved** to support and make sustainable the use of biodiversity and a wide range of ecosystems services.

²⁴ <https://ipbes.net/policy-support>

²⁵ https://knowledge4policy.ec.europa.eu/biodiversity_en

²⁶ <https://biodiversity.europa.eu/>

²⁷ <https://oppla.eu/>

- **Biodiversity research and support policies and processes will be interconnected** at EU and global levels, making use of advanced digital technologies and societal engagement where appropriate.
- **The biodiversity and health nexus will be understood, in particular at the level of ecosystems.** This will be achieved by using the one-health approach, in the context of climate change and globalisation and by addressing contributions and trade-offs.

The impacts have been revised compared with the 2021-2022 work programme in order to take into account R&I activities included in the 2021-2024 strategic plan, but that are yet to be addressed. This was the case, for instance, for several direct drivers of biodiversity loss. The new drafting of the impacts makes clear that they are within the scope of the work programme.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023- BIODIV-01	184.00	30.00	28 Mar 2023
HORIZON-CL6-2024- BIODIV-01		76.00	22 Feb 2024
HORIZON-CL6-2024- BIODIV-02		36.00	22 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)
Overall indicative budget	184.00	142.00	

Call - Biodiversity and ecosystem services

HORIZON-CL6-2023-BIODIV-01

Conditions for the Call

Indicative budget(s)²⁸

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million) ²⁹	Indicative number of projects expected to be funded
		2023	2024		
Opening: 22 Dec 2022 Deadline(s): 28 Mar 2023					
HORIZON-CL6-2023-BIODIV-01-1	RIA	22.00		Around 5.50	4
HORIZON-CL6-2023-BIODIV-01-10	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023-BIODIV-01-11	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023-BIODIV-01-12	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023-BIODIV-01-13	RIA	12.00		Around 6.00	2
HORIZON-CL6-2023-BIODIV-01-14	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-BIODIV-01-15	CSA	7.00		Around 7.00	1

²⁸ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

²⁹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

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Food, Bioeconomy, Natural Resources, Agriculture and Environment

HORIZON-CL6-2023-BIODIV-01-16	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-BIODIV-01-17	RIA	12.00		Around 4.00	3
HORIZON-CL6-2023-BIODIV-01-18	COFUND	30.00	30.00	Around 60.00	1
HORIZON-CL6-2023-BIODIV-01-2	RIA	7.00		Around 3.50	2
HORIZON-CL6-2023-BIODIV-01-3	RIA	6.00		Around 6.00	1
HORIZON-CL6-2023-BIODIV-01-4	RIA	8.00		Around 4.00	2
HORIZON-CL6-2023-BIODIV-01-5	RIA	18.00		Around 9.00	2
HORIZON-CL6-2023-BIODIV-01-6	IA	10.00		Around 10.00	1
HORIZON-CL6-2023-BIODIV-01-7	IA	10.00		Around 5.00	2
HORIZON-CL6-2023-BIODIV-01-8	CSA	3.00		Around 3.00	1
HORIZON-CL6-2023-BIODIV-01-9	RIA	5.00		Around 5.00	1
Overall indicative budget		184.00	30.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.

<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Understanding and addressing the main drivers of biodiversity loss

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-1: Better understanding of routes of exposure and toxicological and ecological impacts of chemical pollution on terrestrial biodiversity

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 22.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to two projects within the area A that is the highest ranked, and two projects highest ranked within the area B, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.

Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, the EU zero pollution action plan and the EU pollinators initiative, projects results will contribute to the following impact of destination “biodiversity and ecosystem services”: “Understand and address direct **drivers of biodiversity decline...**”.

Project results are expected to contribute to all of the following expected outcomes:

- Routes of exposure, linked to ecosystem and biodiversity dynamics to chemicals are better understood,
- Issues raised by the contamination of biodiversity in the natural environment are better known, including risks linked to existing contaminations (legacy), chemicals of emerging concern and accumulations in nature,
- Environmental fate of new chemicals of emerging concern is better understood,
- Toxicological and ecological impacts of contaminants are better understood and risk assessments for relevant highly exposed species are strengthened,
- Prevention and mitigation measures are identified and developed.

Scope: According to IPBES global assessment report³⁰, pollution is one of the five main direct drivers of biodiversity loss. This topic focuses on chemical pollution, which has been increasing in the last decades with key differences by region and by type of pollution. Quantitative assessments include systematically monitored variables with certain emissions into the atmosphere, water bodies and terrestrial systems from industrial activities and households. However, pollution has and is still changing not only in quantitative but also qualitative terms and the monitoring of many dangerous substances, including ones of emerging concern, and knowledge on the way they impact biodiversity and ecosystem services are missing. This topic aims at better understanding the routes of exposure and toxicological and ecological impacts of chemical pollution (excluding industrial contamination) on terrestrial biodiversity and ecosystems³¹ (Area A). According to the EU biodiversity strategy for 2030, pressures include the release of nutrients, chemical pesticides, pharmaceuticals, hazardous chemicals, urban and industrial wastewater and other waste including litter and plastics.

The intensification of the loss of biodiversity in the EU is strongly influenced by the intensification of agriculture, through the high application of fertilizers and pesticides, changes in the species and management of crops, as well as mowing and grazing regimes, and the introduction of new production technologies. Currently, the excessive use of pesticides causes a reduction in the population of, among others, pollinating insects. To support the long-term sustainability of both nature and farming, the EU biodiversity strategy for 2030 works in tandem with the farm to fork strategy. The Commission has committed with both strategies to take action to reduce by 50% the overall use of - and the risk from – chemical pesticides by 2030 and reduce by 50% the use of more hazardous pesticides by 2030 in order to reverse the alarming decline of farmland biodiversity.

Successful proposals are expected to assess the effects and impact of chemical pollutants, in particular the most dangerous substances from agriculture, on the condition of the biodiversity and ecosystems in natural environment (this may include environmental and host associated

³⁰ <https://ipbes.net/global-assessment>.

³¹ Freshwater ecosystems may be also addressed by proposals provided the main focus is on terrestrial biodiversity

microbiomes) and consequently on human health, and identify preventive and mitigation measures. It is important to pay special attention to the fact that the reduction in the population of pollinating insects caused, inter alia, by the excessive use of pesticides in EU agriculture also contributes to reducing the amount of food for birds, reducing the regulation of pests, diseases and invasive alien species. More knowledge is also needed on additional negative impacts from other contaminants of emerging concern, including pharmaceuticals such as hormones and antibiotics, veterinary products and persistent e.g., bio-accumulative substances.

In the context of the EU pollinators' initiative and the pesticide legislative framework³², the EU has increased efforts in the last decade to address this problem. However, knowledge gaps still hinder development and implementation of essential testing methods for a scientifically robust risk assessment of pesticides on wild bees and other wild pollinating insects. This topic will provide a critical contribution to address those knowledge gaps as identified by the European Food Safety Authority (EFSA) and the Commission (Area B) and thereby support the implementation of the EFSA guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus spp.* and solitary bees) and the efforts on broadening the risk assessment safeguards to other wild pollinator species.

Proposals should address Area A or Area B as follows. The Area should be clearly indicated on the application.

Area A: better understanding the routes of exposure of the wild fauna and flora to chemical pollution

Successful proposals should:

- Choose case studies, based on an analysis of chemical contaminations from an environmental history perspective, with representative species on which analysis will be undertaken. Addressing trophic chains is encouraged,
- Develop a method to establish the routes of contamination with chemicals. Priority should be given to cases with potential contamination with chemical pesticides and their metabolites; contaminants of emerging concern, including pharmaceuticals such as hormones and antibiotics, veterinary products and persistent e.g., bio-accumulative substances, SVHC (Substance of Very High Concern) and emerging pollutants. Other substances in particular micro- and nano-plastics are not excluded. Existing contaminations of the environment (legacy) especially from pesticides should also be considered. However industrial contamination is not in the scope of this topic,
- Establish the routes of contamination of the chosen representative species with chemicals, in the case studies,

³² https://ec.europa.eu/food/animals/live-animal-movements/honey-bees/pesticides-and-bees_en;
https://ec.europa.eu/food/plants/pesticides/sustainable-use-pesticides_en

- Assess the risks resulting from such contaminations for species, for ecosystems and for the local environment, including development of effect-based approach to consider mixture effects and synergies,
- In particular, establish models to link chemical ecotoxicity stress to damages on (a) genetic diversity, (b) functional diversity, and (c) ecosystem services,
- Extrapolate to provide an assessment of risks associated with chemical contaminations of terrestrial wild biodiversity at a larger scale,
- Explore prevention and mitigation measures.

Targets groups for this Area are notably regulatory bodies, farmers and other land managers organisations, civil society, local and regional decision –makers.

Successful proposals are expected to cooperate with relevant projects supported by the mission “A Soil Deal for Europe”.

Area B: pollinators and pesticides

Successful proposals should:

- Characterise sources and routes of pesticide exposure in the key pollinator groups (wild bees, butterflies, hoverflies and moths),
- Investigate sensitivity of pollinators to pesticides and identify for each pollinator group sensitive species that: i) are suitable as test organisms in the risk assessment and ii) require safeguards that would indirectly protect other species within the same group (“umbrella effect”),
- Improve prediction of the toxicity endpoints, toxic units for chemicals and data poor compounds (e.g., Quantitative structure-activity relationship (QSAR) models),
- Develop toxicokinetic and toxicodynamic data and models for single and multiple chemicals,
- Generate combined toxicity data (lethal and sublethal effects) of multiple chemicals, improving the availability of data in particular for: i) chronic combined toxicity that would make it possible to identify potential interactions that may lead to deviation from dose addition (potentiation, synergism) and ii) sublethal effects.
- Investigate synergistic effects of typical combinations of pesticides (e.g., based on residue data),
- Devise and test monitoring schemes for establishing the level of contamination of pollen/nectar/water/plant matrices/soil that can support benchmarking in a predictive risk assessment, development of risk indicators and a system-based risk assessment,

- Develop an open source curated database on pollinators and the use of pesticides which would include data and information on: i) exposure and hazard, ii) lethal and sublethal effects, toxicokinetics as well as other stressors (e.g., other chemicals, nutrition, etc.) that could amplify the adverse effects through interaction with pesticides,
- Develop methodologies for risk assessment in open-source tools including toxic units approaches using lethal and sublethal effects as well as validated *in silico* models applying dose addition as the default model or models integrating synergistic effects,
- Develop population models and landscape modelling for the risk assessment of multiple chemicals in pollinators with an aim to integrate hazard and exposure information,
- Develop environmental scenarios for the risk assessment of pollinators that takes into consideration different landscape characteristics and conditions.

Proposals should earmark the necessary resources for cooperation and networking activities. Collaboration with the European partnership on biodiversity Biodiversa+ should be explored, as needed. They should use existing platforms and information sharing mechanisms notably the EC Knowledge Centre for Biodiversity.

This topic should involve the effective contribution of Social Sciences and Humanities (SSH) disciplines.

International cooperation is encouraged.

HORIZON-CL6-2023-BIODIV-01-2: Impact of light and noise pollution on biodiversity

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, and one project highest ranked within the area B, provided that the applications attain all thresholds. Proposals shall

	clearly indicate the area they are applying to.
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Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, projects will contribute to understand and address direct **drivers of biodiversity decline** in both terrestrial and aquatic environments.

Project results are expected to contribute to all following expected outcomes:

- The impact of light and noise pollution on biodiversity and ecosystem services is better understood and nature restoration activities as planned in the EU biodiversity strategy for 2030 are supported, contributing to the objective of “at least 30% of all protected species and habitats not currently in favourable conservation status should reach favourable status or at least show a strong positive trend by 2030”,
- The awareness of private and public stakeholders about the impacts of light and noise on biodiversity is increased,
- Specific measures to assess, prevent and mitigate the negative impacts from light and noise on biodiversity are developed,
- Networking capacity on impacts of light and noise on biodiversity is built.

Scope: Light pollution is the alteration of natural lighting levels due to artificial light at night. It has been rapidly increasing, with the illumination level in developed countries increasing tenfold over the last 50 years. From 2012 to 2016, Earth’s artificially lit outdoor area grew by 2.2% per year. Artificial light at night is a powerful environmental stressor which alters the biological rhythms of living organisms (fauna and flora), modifies species assemblages (e.g. fish in ports) and changes ecosystems at large. There is a broad scientific consensus that it poses a threat to biodiversity and this has led to growing concerns in recent years. Light pollution is specifically known to cause habitat fragmentation, impairing physiology and behaviour in fauna. It is notably thought to be a major factor in the gradual disappearance of insect and bird populations worldwide. Its effects seem to intensify with the use of LEDs (Light-Emitting Diodes) including outside cities. Another domain of light pollution is the horizontally polarised light reflection of certain artificial surfaces (e.g. roads and photovoltaic solar panels), posing significant threat to polarotactic insects that get trapped in search for water bodies.

Noise is an environmental factor which is also given growing attention. According to IPBES, noise’s effects on nature are increasingly observed³³. Expansion of human population, transport networks and extraction have a range of impacts upon species, depending on auditory capacities and noise wavelengths. **Underwater noises** that are due not only to shipping but also to pile drivers, sonars, seismic testing or windfarms are significant marine

³³ IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. <https://doi.org/10.5281/zenodo.3831673>.

pollutants. Noise can be particularly problematic for marine organisms. It has been shown for instance that it may modify behaviour and physiology of invertebrates and it is suspected to increase infection risks and alter spawning behaviour of affected species. It is suspected, for instance, to increase infection risks and spawning behaviour of affected species. Evidence of the impact of noise pollution on **ecosystems** is also growing, like the reduction of the presence of songbirds in cities.

EU policies integrate the **need to protect biodiversity from light and noise** in a limited extent, in particular:

- The **Habitats Directive** requires Member States to take the necessary measures to avoid significant disturbance of protected species in Natura 2000 sites, which, where relevant, is applicable to light pollution (Article 6.2).
- Noise is one aspect of the good environmental status defined in the **Marine Strategy Framework Directive** No 2008/56.

Light and noise pollution in general is addressed in a number of EU policies and directives: the Environmental Noise Directive, the Outdoor Noise Directive, the Environmental Impact Assessment Directive (85/337/EEC). Reducing noise pollution is among the objectives of the EU Action Plan: *'Towards Zero Pollution for Air, Water and Soil'*. Noise and light are defined as pollutants in Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment, (*'pollutant' means a substance, vibration, heat, noise, light or other contaminant present in air, water or land which may be harmful to human health or the environment, which may result in damage to material property, or which may impair or interfere with amenities and other legitimate uses of the environment*). Light and noise pollution is included in one of the six thematic priority objectives of the 8th Environment Action Programme to 2030 (*"pursuing zero-pollution, including in relation to harmful chemicals, in order to achieve a toxic-free environment, including for air, water, soil as well as in relation to **light and noise pollution**, and protecting the health and well-being of people, animals and ecosystems from environment-related risks and negative impacts"*).

There is a need to **better understand the overall impact** of these pollution sources of emerging concern on biodiversity, in particular how the conservation status of species and habitats is affected, mechanisms at stake and how to monitor and mitigate adverse effects.

Targets groups for this topic are notably regulatory bodies, civil society, local and regional decision –makers.

Successful proposals should:

- provide a **comprehensive review on available knowledge** on the impacts of noise and light pollution on biodiversity and ecosystem services (from genetic to species levels) and their combined effects with other drivers of biodiversity loss including climate change and invasive species. The scope should cover terrestrial (both in urban and rural areas), fresh water and marine environments. Projects should build upon research

performed on the European level as well as by the Member States and Associated Countries,

- assess the **overall impacts of noise and light pollution on biodiversity and ecosystem services** in Europe and the magnitude of the problems. This should include a scrutiny of applicable policies and their impact as well as a contextualisation of the problems from an environmental history perspective,
- **improve understanding of mechanisms leading to biodiversity loss**, including effects of noise and light pollution on the behaviour of animals which can eventually affect population viability,
- investigate how noise and light pollution **affect the conservation status** of species and habitats, and identify measures to avoid significant disturbance,
- assess the need and ability of **specific measures to prevent negative impacts** of light and noise on biodiversity, including monitoring,
- assess links to other policies where light and noise management is at place or relevance and synergies can be explored (disaster management, noise mapping etc.),
- **explore innovative solutions** to prevent and mitigate the impacts of light and noise on biodiversity and ecosystem services. This should not be limited to technological solutions.

Proposals should address Area A: terrestrial biodiversity and ecosystems or Area B: aquatic (including marine) biodiversity and ecosystems. The area (A or B) should be clearly indicated on the application.

Cooperation with projects supported by the mission ‘Restore our Ocean and Waters’ is expected for Area B. Successful proposals under Area B are expected to strengthen the European contribution to the United Nations Decade of Ocean Science for Sustainable Development (2021-2030).

Proposals should earmark the necessary resources for cooperation and networking activities. Collaboration with the European partnership on biodiversity Biodiversa+ should be explored, as needed.

This topic should involve the effective contribution of SSH disciplines. Participatory approaches, such as citizen science, could be appropriate modes of research for this action.

International cooperation is encouraged.

HORIZON-CL6-2023-BIODIV-01-3: Interdisciplinary assessment of changes affecting terrestrial and freshwater ecosystems, building on observation programmes

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

Expected Outcome: The expected outcomes should feed in the implementation of the European Green Deal³⁴ and the post-2020 global biodiversity framework of the Convention on Biological Diversity (CBD)³⁵. Project results are expected to contribute to the following impact of destination “Biodiversity and ecosystem services”: “Understand and address direct drivers of biodiversity decline – land and sea use change, natural resource use and exploitation, climate change, pollution, invasive alien species – as well as indirect drivers – demographic, socio-economic, technological, etc.”

Project results are expected to contribute to all of the following outcomes:

- Attribution of ecosystem changes to direct and indirect drivers, and monitoring of driver effects on ecosystems through time;
- Enhanced understanding of the adverse impacts of climate change on biodiversity and ecosystem functioning;
- Enhanced science base, leading to better design and monitoring conservation and restoration actions for terrestrial, freshwater, and transitional ecosystems, including the reduction of greenhouse gas emissions, and increase of carbon removals, and supporting nature-based solutions;
- Enhanced support to a better alignment of the objectives and priorities of the relevant EU directives (Habitat³⁶, Bird³⁷, WFD³⁸, Nitrates³⁹);

³⁴ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

³⁵ <https://www.cbd.int/conferences/post2020/post2020-prep-01/documents>

³⁶ https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

³⁷ https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

³⁸ https://ec.europa.eu/environment/water/water-framework/index_en.html

³⁹ https://ec.europa.eu/environment/water/water-nitrates/index_en.html

- Better and more transparent quantification of various uncertainties in ecosystem data and models, and propagation of these uncertainties into monitoring, spatial prioritization, and other applications.

Scope:

- These activities will foster a collective effort in the EU Member States and Horizon Europe Associated Countries to assess the status of terrestrial, freshwater, and transitional (land to sea) ecosystems (referred to as ecosystems hereafter) and prioritise conservation and restoration actions of these ecosystems including reduction of GHG emissions and increases of carbon removals, with a special focus on the use of the wealth of Earth and Observation data available (remote-sensing, airborne, in-situ data).
- Use long-time series from the enhanced Earth Observation capacity in Europe (e.g. Copernicus) and in International Programmes together with other relevant sources of data to better understand the current and long-term dynamics and functioning of terrestrial and freshwater ecosystems in Europe under conditions related to global change
- Extensive use of ground based and/or airborne in-situ observation using, as appropriate, existing networks, novel observing systems, or citizen science, together with satellite data for assessing the impact of the main natural and anthropogenic pressures on the ecological processes of natural ecosystems, and on their dynamics and functioning (i.e., addressing individual and cumulative effects of multiple stressors), including in exploiting available high-resolution remote-sensing data.
- Assess the status and dynamics of these ecosystems, estimate their vulnerability to multiple stressors including anthropogenic and natural pressures, like climate change, and assess the impact of these stressors on the integrity and resilience of ecosystems
- Modelling of the ecological processes of natural ecosystems and of their interaction with the Earth System (i.e. biological, physical, and chemical processes, including primary production).
- Improving modelling of ecological processes and functional biodiversity under land-use and climate change that leads to ecosystem degradation (i.e. degraded, damaged, and destroyed ecosystems)
- Monitoring the status of natural ecosystems and assessment of the changes in relation to the underlying ecological processes.
- Integrate monitoring and modelling products into existing observatories supporting ecosystem management and conservation, to achieve better prioritisation, design and monitoring of terrestrial and freshwater ecosystem conservation and restoration actions”

This topic is part of a coordination initiative between the European Space Agency (ESA) and the European Commission (EU funded programmes) on Earth System Science. The ESA-EC

Earth System Science Initiative enables EC and ESA to support complementary collaborative projects, funded on the EU side through Horizon Europe and on the ESA side through the FutureEO programme⁴⁰

In particular, ESA plans to complement, collaborate and coordinate with the action funded under this topic with dedicated scientific activities within the ESA Biodiversity Science Cluster (biodiversitysciencecluster.esa.int) which is part of Science for Society element of ESA FutureEO programme (eo4society.esa.int). ESA will also, to the extent possible, provide access to relevant resources (*e.g.*, virtual labs, digital platforms or 3rd party missions)

Proposals should address the collaboration with ongoing or future ESA projects and should towards this end include sufficient means and resources for effective coordination. Applicants are encouraged to enter in contact with the relevant ESA biodiversity science cluster projects and include in their proposals a work package/activities to ensure coordination with ESA relevant actions. The ESA biodiversity cluster focusses on the development, validation, and scientific analysis of novel satellite data products, the characterisation the structure and dynamics of terrestrial and freshwater ecosystems, the exploitation of the synergistic observation opportunities offered by the existing and coming Earth Observation missions (*e.g.*, Copernicus sentinels, Earth Explorers, national missions) and advancing on the understanding of the response of ecosystems to different stressors using satellite technology.

Project activities shall fully exploit and build complementarities with the ongoing work regarding the establishment of the European Open Science Cloud and interact with relevant projects developing metadata standards and added value tools to ensure interoperability within and across fields of study.

Collaboration with the European Biodiversity Partnership (Biodiversa+) should be explored, as needed.

Biodiversity protection and restoration

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-4: Nature protection: Better methods and knowledge to improve the conservation status of EU-protected species and habitats

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative</i>	The total indicative budget for the topic is EUR 8.00 million.

⁴⁰ The Programme will be available here: https://www.esa.int/Applications/Observing_the_Earth/FutureEO

<i>budget</i>	
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, and one project within the area B that is the highest ranked, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.

Expected Outcome: In line with the objectives of the European Green Deal, the EU biodiversity strategy for 2030, and existing EU nature legislation (Birds and Habitats Directives), project results will contribute to the following impact of destination “biodiversity and ecosystem services”: “to plan, manage and expand terrestrial and marine protected areas and improve the conservation status of species and habitats, based on up-to-date knowledge and solutions”. More specifically, project results will improve the setting of conservation objectives and measures for EU-protected habitats and species, thereby also ensuring that the network of Natura 2000 sites enable the maintenance or restoration of favourable conservation status.

Results of individual projects are expected to contribute to at least one of the following expected outcomes:

- Favourable conservation status for species and habitats covered by the EU Birds and/or Habitats Directives, and clarification of what is needed on an EU or biogeographical scale or other ecologically relevant scale (e.g., major basin, major flyway) in line with the relevant parameters and their values on the basis of which Member States define favourable conservation status.
- Better implementation of the EU Birds Directive specifically in relation to the 42 huntable bird species listed in Annex II of the directive which are not in a secure status, by filling scientific knowledge gap in relation to the amount and quality of habitat that is needed for these species (with a focus on their breeding habitats), and to ensure that their hunting is carried out sustainably.

Scope: Proposals should address Area A or Area B as follows. The Area should be clearly indicated on the application.

Area A: Improving the conservation status of habitats and species protected under the Habitats and/or Birds Directive.

Successful proposals should:

- improve the definition of “favourable conservation status” of groups of habitats and/or species protected under the EU Birds and/or Habitats Directives, provide guidance on how to improve the monitoring of habitats and species and/or the setting of favourable reference values and favourable reference conditions in Member States. The focus of this work should be on data-deficient habitats and species, on habitats and species in the worst status (conservation status and/or EU Red list status), or with declining trends⁴¹ and/or on those species the recovery of which has created tensions with stakeholders (e.g., large carnivores, some geese species, cormorants, etc.). A specific focus could also be placed on habitats and species which depend on the maintenance of sustainable agricultural land management.
- ensure the recovery of habitats and/or species in unfavourable status and/or with a declining trend according to the reporting under the EU Birds and/or Habitats Directive (2019)⁴² by providing methodologies and recommendations on how to identify recovery needs for populations or restoration needs for habitats, including with regard to geographical location, quantity and quality of habitat to be restored.

Area B: Improving the conservation status of huntable bird species listed in Annex II of the Birds Directive.

Successful proposals should:

- Identify habitat management and restoration needs for huntable bird species in non-secure status, with a focus on agricultural habitats, evaluate the impact of hunting and provide recommendations for an adaptive harvest management of these species, considering the available species-specific data on habitat quality and quantity impacting their fecundity and breeding success and survival rate for these species. Preparatory work done by the Commission Services should be taken into account⁴³.

Proposals should closely follow and ensure consistency with any ongoing or future relevant policy developments, with a particular focus on the voluntary EU targets for improving the

⁴¹ State of Nature in the EU: Results from reporting under the nature directives 2013-2018: [State of nature in the EU — European Environment Agency \(europa.eu\)](#) National summary dashboards - Habitats Directive – Art.17: [National summary dashboards - Habitats Directive – Art.17 — European Environment Agency \(europa.eu\)](#) National summary dashboards - Birds Directive – Art.12: [National summary dashboards - Birds Directive – Art.12 — European Environment Agency \(europa.eu\)](#)

⁴² Article 17 Reporting Habitats Directive: <https://nature-art17.eionet.europa.eu/article17/> Article 17 National Summaries: [CIRCABC - MS National Summaries \(europa.eu\)](#) Article 12 Reporting Birds Directive: <https://nature-art12.eionet.europa.eu/article12/> Article 12 National Summaries: [CIRCABC - MS National Summaries \(europa.eu\)](#)

⁴³ [habitats - Library \(europa.eu\)](#)

status of species and habitats⁴⁴ and increasing the coverage of protected areas⁴⁵, as well as in relation to the upcoming Commission proposal for legally binding restoration targets.

Proposals should earmark the necessary resources for cooperation and networking activities. They are expected to link with relevant projects such as EuropaBON, LIFE Integrated Projects and LIFE Strategic Nature Projects as well as with relevant projects under Horizon Europe topics, such as HORIZON-CL6-2021-BIODIV-01-02: Biodiversity and Ecosystem Services Collaboration with the European partnership on biodiversity Biodiversa+ should be explored, as needed.

The possible participation of the JRC would help ensure that the methodologies proposed can support environmental compliance assurance, particularly by leveraging geospatial intelligence.

HORIZON-CL6-2023-BIODIV-01-5: Understanding and reducing bycatch of protected species

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 9.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 18.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, the Birds, Habitats and Marine Strategy Framework Directives and the common fisheries policy, as well as the “Action plan to conserve fisheries resources and protect marine ecosystems”, projects’ results will contribute to improving the monitoring and assessment of the impact of bycatch in different fishing gears on protected and sensitive species, including in protected areas, defining and implementing effective mitigation and management tools, based on up-to-date knowledge and solutions. They will contribute to the following impacts of destination “Biodiversity and ecosystem services”: “Understand and address direct drivers of biodiversity decline – land and sea use change,

⁴⁴ Guidance to Member States on how to select and prioritise species/habitats for the 30% conservation improvement target under the strategy: [biodiversity nature - Library \(europa.eu\)](https://ec.europa.eu/biodiversity/nature-library/europa.eu)

⁴⁵ Commission Staff Working Document: Criteria and guidance for protected areas designations: [biodiversity nature - Library \(europa.eu\)](https://ec.europa.eu/biodiversity/nature-library/europa.eu)

natural resource use and exploitation, climate change, pollution, invasive alien species – as well as indirect drivers – demographic, socio-economic, technological etc.” and “Plan, manage and expand protected areas and improve the status of species and habitats based on up-to-date knowledge and solutions”.

Selected proposals are expected to contribute to all following expected outcomes:

- Elimination or significant reduction of bycatch is achieved for marine mammals (e.g., up to 8500 dolphins killed each year in the Bay of Biscay), sea turtles (currently ~70 000 killed each year in EU waters) and seabirds (currently ~200 000 killed each year in EU waters) and sensitive or endangered fish species (e.g. elasmobranchs and sturgeons).
- Bycatch risks and reasons are well understood, including the spatial and temporal distribution of sensitive species.
- Information needed to improve Member States’ monitoring programmes and implementation of management actions is acquired.
- Impacts of bycatches (rate of interactions, fate of individuals post-release, by gear and by fishery, impact on population abundance and sustainability) on the conservation status of species are assessed and understood.
- Interactions of bycaught species with fishing gears are minimised and where possible eliminated, and mortality following interaction is reduced.
- Member States are enabled to reach the target of the EU biodiversity strategy for 2030 to eliminate or reduce bycatch of sensitive species and to step up bycatch monitoring, as well as to fully and coherently implement the EU environmental and fisheries legislation and the Action plan to conserve fisheries resources and protect marine ecosystems and to protect marine ecosystems as required by the EU climate adaptation strategy.
- Member States are enabled to set criteria for Good Environmental Status under the Marine Strategy Framework Directive in relation to maintaining biodiversity and ensuring that all elements of marine food webs occur at normal abundance and diversity.

Scope: Proposals should work in one or more European regional seas and/or in other marine areas where EU fleet operates and should:

- Evaluate bycatch risk on a sea basin and/or local level (in particular for marine mammals, sea turtles, seabirds, and sensitive or endangered fish species such as e.g., elasmobranchs and sturgeons) by identifying the fishing activity of high-risk gear and comparing it with the spatial distribution/abundance of affected species, producing bycatch risk maps for all relevant species/gear interactions. Gather data and improve knowledge on the conservation status of bycaught species.
- Develop or improve tools for monitoring of bycatch, including long-term observation and surveying programmes, e.g. through extending the use of remote electronic

monitoring and artificial intelligence-based image recognition, enabling Member States to identify and implement adequate conservation measures as required by EU legislation.

- Close the knowledge gaps on the locations, precise extent (number of individuals, season and locations) and reasons for bycatch (relevant métiers and fisheries), focusing on species threatened by extinction or in a bad conservation status.
- Assess the effectiveness of existing bycatch mitigation methods (such as spatio-temporal closures or gear modifications) as well as of bycatch handling and safe release guidelines, and address their shortcomings, including through the development and testing of new approaches, focusing on high risk fisheries and most threatened species and areas.
- Engage relevant stakeholders and environmental and fishing authorities and operators in the research projects promoting co-design in the development and testing of new approaches.

This topic is expected to contribute to the conservation of whales, whose role in carbon sequestration in the ocean is now thought to be important, therefore this topic will indirectly contribute to carbon sequestration.

Proposals should earmark the necessary resources for cooperation and networking activities. Proposals should build on existing relevant projects, including funded under Horizon 2020 and LIFE programme, as well as relevant work done by the International Council for the Exploration of the Sea (ICES) and in Member States. They should also collaborate with Horizon Europe projects selected under topics on cumulative impact of stressors (i.e., HORIZON-CL6-2021-BIODIV-01-04: Assess and predict integrated impacts of cumulative direct and indirect stressors on coastal and marine biodiversity, ecosystems and their services) and marine/coastal observation & mapping (i.e., HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems). Additionally, they should collaborate with projects that will be funded under the Mission Restore our Ocean and Waters by 2030.

Concrete efforts shall be made to ensure that the data produced in the context of projects are FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide “FAIR-by-design” data, i.e., data that is FAIR from its generation.

International cooperation is encouraged, in particular with non-associated third countries participating in regional fisheries management organisations of EU interest.

The possible participation of the JRC in the project would consist in providing and analysing fisheries data as Member States upload some of the collected data to JRC databases.

HORIZON-CL6-2023-BIODIV-01-6: Restoration of deep-sea habitats

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5-6 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal and, in particular with the objectives of the EU biodiversity strategy for 2030, the EU proposal for a nature restoration law⁴⁶ and the Birds and Habitats Directives, the Marine Strategy Framework Directive (MSFD), the Regulation 734/2008 on the protection of vulnerable marine ecosystems in the high seas from the adverse impacts of bottom fishing gears, the climate adaptation and mitigation strategies, the project should contribute to the destination impacts of aiming at bringing back biodiversity on a path to recovery, and preserving and sustainably restoring ecosystems and their services, planning, managing and expanding protected areas, mainstreaming biodiversity, ecosystem services and natural capital in the society and the economy, and addressing direct and indirect drivers of biodiversity decline. They should provide public authorities, as well as operators in marine ecosystem restoration, with solutions to plan and upscale restoration operations of deep-sea habitats based on up-to-date knowledge and solutions.

Projects results are expected to contribute to all of the following expected outcomes:

- Better prioritisation of sites for active restoration in EU and Associated Countries seas and definition of ecosystem functioning restoration targets, considering short to long timescales, and taking into account impacts of climate and other abiotic changes;
- Better decision making and contribution to policy formulation and implementation linked to protecting and restoring deep-sea marine biodiversity, ecosystem functioning

⁴⁶ [EUR-Lex - 52022PC0304 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2022/2424/oj)

and ecosystem services and blueprints for the financing and the selection of tested active restoration approaches, tools and monitoring of their effects, taking into account cost-benefit analysis and integrating ecosystem services and natural capital accounting;

- Advanced knowledge on deep-sea ecosystems adaptation and demonstrated innovative and technically challenging active restoration of deep-sea habitats for climate change adaptation and mitigation.

Scope: Marine ecosystems usually have long recovery times. Climate change is adding risk factors. Effects of passive restoration (protection measures) may take multiple decades before benefits may be felt. This is even more the case for deep-sea ecosystems. They have low energy density, slower biochemical processes and assemble species with long life cycle / span. Active restoration should be explored to help accelerate the restoration.

Proposals should build on and capitalise on the knowledge base developed and lessons learnt from the Horizon 2020 MERCES project, notably its census of European marine key habitats maps, degraded habitats maps, key habitats restoration potential and its trials on deep-sea restoration, as well as from other national or EU relevant past or ongoing projects in the field of deep-sea ecosystems exploration from Horizon 2020, EEA Grants and Horizon Europe (notably in topic HORIZON-CL6-2021-BIODIV-01-03 and HORIZON-CL6-2022-CLIMATE-01-02).

The restoration activities should take place in areas with degraded habitats, and where protection measures against the causes of their degradation are already in place.

Proposals should develop and test innovative and technically challenging active restoration of deep-sea habitats. For this reason, and the cost of accessing the deep-sea, only one project may be funded with the budget available. Proposals should integrate different disciplines and novel approaches for the restoration that consider connectivity (including migratory species & vertical connections) in space and time, ecosystem modelling, as well as on site access, observation, and monitoring.

The restoration focus should not be only on species traits targets (population, assemblage, genetic diversity, sex determination, etc.), but also on ecosystem functions including adaptation potential. The proposals should include abiotic changes due to climate impact scenarios in identifying niche and refuge niche.

Proposals should set up governance frameworks for the restoration by involving local and national relevant actors (those having an impact on the achievement of the restoration goals, those having an interest and those who are impacted by related actions) to enable acceptability, ownership and a mechanism for long-term commitment to the restoration that exceed typical business and political cycles on financing, managing, regulating, monitoring and enforcement. Some short-term objectives are required to allow for measurements of restoration impacts in a reasonably shorter time frame to get on the right trajectory, but then check on mid- to long- term (5-20 years) should be planned.

Proposals should advance the knowledge base on the socio-economic costs and benefits of deep-sea restoration: including addressing the socio-economic importance of deep-sea ecosystems; considering upscaling issues and costs with restoration of deep-sea habitats, and timescales considerations.

Proposals should identify and test additional protection and management measures of the areas, to support the active restoration interventions over the long time, and provide recommendations for their application for new protected areas.

The proposals should contribute to filling the gaps in assessing deep-sea biodiversity recovery valuing changes in ecosystem goods and services; and contribute to define a natural capital accounting for deep-sea habitats.

The projects funded under this topic should build links with other relevant projects and initiatives such as Horizon 2020 and Horizon Europe projects in the field of deep-sea ecosystems and with projects funded under the European Mission ‘Restore our ocean and waters by 2030’, in particular with the Mission activities under objective 1 – protect and restore marine ecosystems and their biodiversity, and with the Mission lighthouse activities and Blue Parks, as well as with the Mission implementation monitoring system that will be part of the Mission Implementation Support Platform for reporting, monitoring and coordination of all relevant implementation activities. Proposals should outline a plan on how they intend to collaborate with other projects and initiatives, by e.g. participating in joint activities, workshops, common communication and dissemination activities, etc. Applicants should allocate the necessary budget to cover the plan. Relevant activities of the plan will be set out and carried out in close cooperation with relevant Commission services, ensuring coherence with related policy initiatives.

In order to achieve the expected outcomes in integrating and coordinating these different scaled approaches, international cooperation is strongly encouraged. A strong linkage should be ensured with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance. Actions under this topic will build upon and link with Horizon projects. All in-situ data collected through actions funded from this call should follow INSPIRE principles and be available through open access repositories supported by the European Commission (Copernicus, GEOSS, and European Marine Observation and Data Network (EMODnet). Where relevant, creating links to and using the information and data of the European Earth observation programme Copernicus, the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS) is expected.

Collaboration with the relevant existing European Research Infrastructures is considered necessary.

HORIZON-CL6-2023-BIODIV-01-7: Demonstration of marine and coastal infrastructures as hybrid blue-grey Nature-based Solutions

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5-7 by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁷ .

Expected Outcome: In line with the European Green Deal and, in particular with the objectives of the EU biodiversity strategy for 2030, the EU proposal for a nature restoration law⁴⁸ and the Birds and Habitats Directives, the Marine Strategy Framework Directive (MSFD), the climate adaptation and mitigation strategies, the new approach for a sustainable blue economy, the EU guidance document on integrating ecosystems and their services in decision-making, the projects should contribute to the destination impacts of mainstreaming biodiversity, ecosystem services and natural capital in the society and the economy, and addressing direct and indirect drivers of biodiversity decline. They should provide public authorities, as well as related infrastructures operators in their design, engineering, construction, installation and exploitation, with nature centred solutions that are beneficial for biodiversity, ecosystem services and the original infrastructure purpose (renewable energy production, or coastal protection).

Projects results are expected to contribute to all of the following expected outcomes:

- Pave the way for a new level of ecosystem-based management, in which future marine and coastal infrastructures (e.g., protection of coastal and urban areas from climate change impacts, offshore windfarms, harbours, tourism development, bridges, etc.) are intentionally designed and actively used to support the restoration (where the term encompasses multiple approaches to actively rehabilitate, repair, reallocate or reinvent

⁴⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁸ [EUR-Lex - 52022PC0304 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/lex/52022PC0304/1/en/).

damaged biodiversity and ecosystem processes and services) of marine ecosystem health and services (including climate mitigation & adaptation), where nature-based solutions alone cannot be envisaged;

- Contribute to the development of a framework for “blue buildings” rating based on the model of the LEED⁴⁹ (Leadership in Energy and Environmental Design) green building rating system;
- Upscale Blueprints integrating the conception, installation, exploitation, maintenance of hybrid blue-grey infrastructures that are beneficial to ecosystem functioning and restoration;
- Mainstream biodiversity in marine and coastal infrastructures and activities.

Scope: Climate policies trigger the development of several-large scale infrastructures in the marine and coastal environment. In particular, the EU offshore renewable energy plan targets for 40 GW of EU wave and tidal energy by 2050 from the 13 megawatts (MW) operating today. Climate adaptation and impacts reduction strategies imply the increase of an already important development of coastal and urban protection from erosion, sea level rise and extreme events. Global trade is supported by enlarging or building new ports. They may cause trade-offs against endemic biodiversity and alter on-going natural eco-evolutionary responses. They may cause trade-offs against endemic biodiversity and ecology, but they could protect, restore or harbour functional ecosystems (even if mostly novel) providing critical functions and services opportunities to biodiversity by mimicking and integrating natural processes and features in their design.

Proposals should be large scale demonstration of hybrid nature-based solutions with built coastal and marine infrastructures to preserve ecosystems and/or support their restoration. The infrastructure purpose should be originally aiming at climate policy targets (e.g., hard and soft coastal or urban protection from climate change impacts – sea level rise, extreme events, erosion - , renewable energy farms or islands, maritime services and safety, etc.) and with the highest potential for being replicated, scaled-up and deployed. Proposals should also assess the putative impacts/secondary effects of these infrastructures, notably regarding cumulative impacts of the biodiversity drivers such as climate, land and sea-use change (infrastructures), invasive alien species, etc. The action should consider impacts and opportunities from ecological connectivity with neighbouring ecosystems.

Proposals looking at infrastructures serving several purposes (such as Low Trophic Aquaculture; educational and recreational purposes; support of fishery via creation of nursery habitats; bio filtration and bio depollution) are encouraged. Proposals should integrate the relevant results of other Horizon 2020 or national projects on multi-use of the marine space.

Proposals should look how nature benefits could be put at the centre of the infrastructures by addressing the selection or the development of materials for their construction, design, installation, and maintenance, to maximise the positive effects on natural processes and

⁴⁹ <https://www.usgbc.org/leed>

enable their preservation (if in good status) or restoration of the local marine ecosystems and their socio-ecological management.

Proposals should explore and improve co-creation approaches with the relevant actors (infrastructure owners, governance, civil society and end-users or beneficiaries) for the design, installation and management of these built infrastructures with nature centred design. Social innovation is recommended when the solutions are at the socio-technical interface and require social change, new social practices, social ownership or market uptake. Proposals should provide evidence and data of the multiple benefits and potential trade-offs of these hybrid solutions on short and long-term timescales and, in particular, for the purposes of marine biodiversity and ecosystems functions protection and restoration, but also for the blue economy and society as a whole.

In particular, for hybrid infrastructures aiming at protection against climate impacts, the proposals should provide evidence-based analysis of their efficiency compared to more usual infrastructure approaches, and to usual nature-based solutions, or as alternatives where “NBS alone” cannot be envisaged due to local environmental features. The projects funded under this topic should build links with projects funded under the European Mission ‘Restore our ocean and waters by 2030’, in particular with the Mission activities under objective 1 – protect and restore marine ecosystems and their biodiversity, and with the Mission lighthouse activities and Blue Parks as well as with the Mission implementation monitoring system that will be part of the Mission Implementation Support Platform for reporting, monitoring and coordination of all relevant implementation activities. Proposals should also connect with relevant projects under Horizon Europe topics, such as (HORIZON-CL6-2022-BIODIV-01-03), on support of development of policies, business models and market conditions to scale up and speed up the implementation of nature-based solutions.

Projects are expected to contribute to the New European Bauhaus (NEB) initiative⁵⁰ by interacting with the NEB Community, NEBLab and other relevant actions of the NEB initiative through sharing information, best practices, and, where relevant, results.

In order to achieve the expected outcomes in integrating and coordinating these different scaled approaches, international cooperation is strongly encouraged. A strong linkage should be ensured with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance. Actions under this topic will build upon and link with Horizon projects. All in-situ data collected through actions funded from this call should follow INSPIRE principles and be available through open access repositories supported by the European Commission (Copernicus, GEOSS, and EMODnet). Where relevant, creating links to and using the information and data of the European Earth observation programme Copernicus, the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS) is expected.

⁵⁰ See COM/2021/573 final on ‘The New European Bauhaus - Beautiful, Sustainable, Together’ and https://europa.eu/new-european-bauhaus/index_en

Collaboration with the relevant existing European Research Infrastructures is considered necessary.

Mainstreaming biodiversity in society and the economy

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-8: Addressing biodiversity decline and promoting Nature-based Solutions in higher education

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵¹ .

Expected Outcome: This topic aims to contribute to education, skills development and awareness raising about biodiversity loss, and how this can be addressed, notably with Nature-based Solutions (NBS), in the higher education sector. This is fundamental to further implement and upscale NBS and to mainstreaming biodiversity, ecosystem services, including carbon sequestration, climate resilience and pollution reduction, and natural capital in the society and economy. Through education and NBS, the topic contributes to the transformative change necessary to tackle societal challenges, notably addressing the EU biodiversity strategy for 2030 and the EU climate adaptation strategy.

Project results are expected to contribute to all of the following expected outcomes:

⁵¹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Improved and more coordinated education programmes and increased awareness about biodiversity loss and how this can be addressed together with climate change notably through NBS, in universities and technical schools.
- Increased awareness and development of skills among young people, teachers, professional organisations, on biodiversity, climate change and NBS.
- A transdisciplinary dialogue on inclusive NBS contributing to nature-based thinking and a nature-positive economy, drawing on inclusiveness, the pluralities of values and of knowledge.
- A sustainable recovery of society and the necessary transformative change through biodiversity-friendly actions, professional, collective and personal attitudes.

Scope: The European Green Deal communication puts forward a specific action for the Commission to prepare a European competence framework to help develop and assess knowledge, skills and attitudes on climate change and sustainable development. This competence framework should serve as a reference tool for the development and assessment of competences on environmental sustainability. Following the EU biodiversity strategy for 2030, the Commission proposed in 2022 a Council Recommendation on encouraging cooperation in learning for environmental sustainability, including biodiversity learning and teaching, which was accompanied by a competence framework.

Education plays indeed an essential role in addressing environmental sustainability by raising awareness and instilling the key competences needed for changing personal behaviours and empowering people to act in their respective communities, especially in the current context of economic recovery, biodiversity crisis and climate change.

Drawing on state-of-the-art science, including the results of EU-funded R&I projects on biodiversity and NBS, the selected project will develop and disseminate concrete guidance for higher education institutions. It will target vocational training, universities and technical schools, for greater involvement with citizens and professional organisations, to mainstream biodiversity and NBS into their learning, teaching and capacity building programmes.

Transdisciplinary collaboration is a fundamental prerequisite for mutual understanding of people working in different sectors when co-creating and co-implementing NBS. There is a need to go beyond tackling challenges individually and perceive the systemic complexity of challenges to be addressed by NBS, by working together across silos, sectors and epistemologies. This paradigm shift in education and skills development will contribute to the necessary transdisciplinary work for tackling both biodiversity and climate crises at different decision-making scales.

The successful proposals should:

- Develop networking and collaboration schemes on higher education curricula and programmes on NBS, as well as researcher mobility initiatives.

- Support and promote the teaching of NBS co-design and co-creation (considering biodiversity and ecosystem services as their fundamental building blocks) as part of high education degrees and further education qualifications. Explore ways of raising awareness and teaching the importance of biodiversity, including genetic, functional and taxonomic diversity, and ecosystem services, including carbon sequestration, climate resilience and pollution reduction, especially in those academic fields where this is still greatly lacking (e.g., economics, engineering, etc).
- Encourage holistic approaches centred on biodiversity and the interlinks with climate change; and assess and propose university curricula for NBS-related disciplines, as well as for universities of technology, engineering and other non-biodiversity focused studies that are relevant for NBS design, implementation, monitoring and maintenance.
- Develop collaboration, guidance, benchmarking and exchange of best practices on how the higher education sector can address its impacts on biodiversity when addressing climate change (e.g., in built infrastructure, consumption and other processes), including through NBS.
- Explore innovative ways of involving higher education institutions, their students and staff in tackling the biodiversity crisis, together with the climate crisis (e.g., through documentaries, awards, art interventions, campus improvements).
- Develop NBS capacity building and skills development programmes, in different EU official languages and knowledge transfer mechanisms, in coordination with the relevant professional organisations and building on the work developed on NBS standards and protocols, e.g. by the Horizon 2020 and Horizon Europe NBS project portfolio, or by the IUCN, so that new technical solutions and standards are used in the NBS supply market.
- In view of a just ecological transition, provide specific NBS vocational training and skills development programmes for the youth, long term unemployed or other social groups in need (including in most deprived regions), co-developed with the relevant professional training and social inclusion institutions.
- Explore innovative ways of ensuring a transdisciplinary dialogue on biodiversity, drivers of biodiversity change, climate and NBS among communities of practice and professional organisations, as well as in universities. In this respect, develop approaches to ensure the quality of transdisciplinary programmes and provide an innovative dialogue space ensuring transdisciplinarity and welcoming the pluralities of values and knowledge, in view of transformative change to tackle both climate and biodiversity crises.
- Outreach and cooperation activities between higher education institutions and citizens, the local and regional communities, businesses, research centres, or museums, supporting challenge-based and experiential learning with real-life applications, promoting nature-based thinking, public debate and a change of behaviour.

- Organise academic residences or summer schools with the relevant partners in Member States, where students can join interdisciplinary and multicultural discussions and witness, in person, the co-creation, co-implementation and co-monitoring of NBS, also in view of emancipatory action for transformative change.

Proposals should address all of the above points.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. In particular, SSH should be involved in view of ensuring the understanding and inclusion of different values and perceptions of nature, biodiversity and NBS, as well as issues of knowledge creation, identity and culture shaping NBS co-creation and co-implementation.

Proposals should include specific tasks and allocate sufficient resources to collaborate with other projects selected in any other relevant topic, by participating in joint activities, workshops, as well as common communication and dissemination. In particular, the project should build on the existing outputs and create synergies with the relevant projects in Erasmus+, the Horizon Europe Missions (notably “Restore Our Ocean and Waters by 2030” and “Adaptation to climate Change”), as well as the Horizon 2020 NBS project portfolio and its task forces. The project should also foresee synergies with HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions; with the HORIZON-CL6-2021-COMMUNITIES-01-06: Inside and outside: educational innovation with nature-based solutions; and HORIZON-CL5-2023-D1-01-10: Improving the evidence base regarding the impact of sustainability and climate change education and related learning outcomes. Applicants should plan the necessary budget to cover these activities without the prerequisite to define concrete common actions at this stage.

Proposals should ensure that all evidence, information and project outputs are accessible through the Oppla portal (the EU repository for NBS).

HORIZON-CL6-2023-BIODIV-01-9: Biodiversity, economics and finance: unlocking financial flows towards reversing of biodiversity loss

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: In line with the European Green Deal priorities and in particular with the EU biodiversity strategy for 2030 and the 2030 climate target plan, the successful proposal will help unlock financial flows needed for reversing biodiversity loss and help better implement the sustainable finance taxonomy, thus contributing to mainstream biodiversity, ecosystem services and natural capital in the society and economy and to build approaches for enabling transformative changes to face societal challenges, including through the deployment of nature-based solutions (NBS).

Project results are expected to contribute to all of the following expected outcomes:

- Mobilisation of mainstream finance to slow down, and reverse biodiversity loss in the broader context of environmentally sustainable development, by catalysing nature-positive investments such as nature-based solutions, and by promoting a more holistic approach that considers nature's essential contributions to other objectives such as those related to climate, health, food, and water security;
- New knowledge, methodologies, and tools to support the implementation of the EU strategy for financing the transition to a sustainable economy, with a view to reorienting financial flows towards activities that benefit protection, restoration and sustainable management and use of biodiversity and ecosystems, including information, tools, and metrics to better integrate biodiversity, ecosystem services and natural capital considerations in their decision-making processes;
- Better awareness, understanding and know-how of economic actors, the financial community, and key institutions, public and private, about the opportunities and barriers (knowledge gaps, skills gaps, etc.) associated with the implementation of the sustainable finance taxonomy⁵², including its technical screening criteria⁵³ and 'Do No Significant Harm' (DNSH) principle in regard of the environmental objective focusing on the protection and restoration of biodiversity and ecosystems⁵⁴
- Contribution to the implementation of the EU biodiversity strategy for 2030 by helping to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people,

⁵² Delegated Acts of the correlated Regulation (EU) 2020/852: one adopted Act, C/2021/2800 final, available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM:C\(2021\)2800](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM:C(2021)2800) and the other one in draft stage, but to be adopted in 2022.

⁵³ Detailed technical screening criteria are being set out in Delegated Acts of the Taxonomy Regulation for relevant NACE activities to determine whether an economic activity 'Substantially Contribute' (SC) to the 5 environmental objectives as described in art. 9 of the Regulation, including the objective for the protection and restoration of biodiversity and ecosystems (2). Besides this, detailed technical criteria have been set up for relevant NACE activities to determine that an economic activity which substantially contributes to any of the other 5 environmental objectives as described in art. 9 of the Regulation, does not significantly harm (DNSH) the objective for the protection and restoration of biodiversity and ecosystems.

⁵⁴ For 'SC' through any of the following means: (a) nature conservation (habitats, species); protecting, restoring and enhancing the condition of ecosystems and their capacity to provide services; (b) sustainable land management, including adequate protection of soil biodiversity; land degradation neutrality; and the remediation of contaminated sites; (c) sustainable agricultural practices, including those that contribute to halting or preventing deforestation and habitat loss; (d) sustainable forest management.

climate, and the planet and by better measurement, monitoring, and management of biodiversity.

Scope: Nature provides all sorts of essential services to our societies: clean air and water, food, pollination, carbon sequestration and pollination, it sustains tourism and leisure activities, it contributes to mental and physical health and delivers many other functions. In many instances, nature is also the most effective insurance policy – protecting us from floods, landslides, fires, or extreme heat.

However, we are facing an unprecedented crisis of biodiversity loss, posing a serious threat to our future welfare. 75% of the land-based environment and about 66% of the marine environment have been significantly altered by human actions. Nearly 1 million species are at risk of extinction from human activities. The loss of clean air, drinkable water, pollinating insects, forests, and species pose as big a threat to species survival as climate change. The loss of biodiversity increases the challenge of limiting climate change, as healthy ecosystems naturally absorb carbon from the atmosphere.

At the same time, Research findings⁵⁵ indicate that the conservation and effective management and guardianship of at least 30% of the planet in the most important places for biodiversity could protect up to 80% of plant and animal species, and secure 60% of the planet's carbon stocks and 66% of the planet's clean water. The latest IPCC report complements this statement: conservation of approximately 30% to 50% of the planet will also be key in maintaining the resilience of biodiversity and ecosystem services at a global scale. UNEP report on the State of Finance for Nature⁵⁶ states that investments in NBS need to triple by 2030 and to quadruple by 2050⁵⁷ if the world is to meet its climate change, biodiversity and land restoration targets. As underlined in the same report, more research is needed on how private financing can be strengthened and what are the low-hanging investment opportunities.

The EU sustainable finance taxonomy and other similar initiatives are underway with the aim to help guide investments towards more sustainable outcomes, in line with the objectives of the European Green Deal. They constitute a unique opportunity for ramping up investments in natural capital and projects that substantially contribute to biodiversity, as well as to other challenges, such as nature-based solutions and ecosystem restoration contributing to climate mitigation and adaptation.

Mobilising private investment, in particular to support the scaling up of NBS and the market for NBS in the European Union is key, in the context of a market characterised by smaller scale projects predominantly grants funded by the public sector.

⁵⁵ Jung, M., Arnell, A., de Lamo, X. *et al.* Areas of global importance for conserving terrestrial biodiversity, carbon and water. *Nat Ecol Evol*5, 1499–1509 (2021). <https://doi.org/10.1038/s41559-021-01528-7> and IPCC report 'Climate Change 2022: Impacts, Adaptation and Vulnerability'

⁵⁶ [State of Finance for Nature | UNEP - UN Environment Programme.](#)

⁵⁷ To amount to USD 8.1 trillion, and will be over USD 536 billion annually. USD 133 billion currently flows into nature-based solutions annually, with public funds representing 86% and private finance only 14%.

The project(s) should:

- Co-identify, analyse, and explore solutions to address potential barriers and hurdles in the implementation of the Taxonomy Regulation, for example related to the interpretation and the collection of data for biodiversity relevant technical screening criteria. The project(s) could address the technical criteria ‘Substantially Contribute’ to climate change mitigation and adaptation while following the ‘Do No Significantly Does Harm’ in terms of the protection and restoration of biodiversity and ecosystem; as well as the criteria ‘Substantially Contribute’ to the protection and restoration of biodiversity and ecosystem, especially for activities related to land management, restoration of ecosystems and remediation;
- More particularly, identify for which criteria/sectors there are practical implementation barriers and gaps, for example through analysis of case studies, when collecting the remaining Research and Innovation gaps;
- Building on the existing community's engagement in relevant Horizon 2020 and LIFE projects⁵⁸, engage the relevant stakeholders from the financial and biodiversity and NBS community involved in the implementation of the regulations in this analysis, and in the exploration and co-development of solutions in order to close the implementation gaps. This includes for example academics, regulatory bodies, financial institutions, civil society, industry and NGOs having co-developed relevant standards, protocols and certification schemes;
- Analyse the investment landscape in relation to protection and restoration of biodiversity and ecosystems, identifying best-practice case studies and evaluating the leverage potential of the EU taxonomy and its key success factors. Explore pathways for the future development of the taxonomy that could generate the most positive biodiversity outcomes;
- Provide the necessary guidance, training, and tools both for financial entities and for entrepreneurs engaged in “nature positive” activities, for the interpretation and collection of data of the technical screening criteria for determining whether an economic activity substantially contribute (SC) to one or more objectives, as set in the Regulation. It should also guide the interpretation of the technical screening criteria for determining whether an economic activity does significant harm (in relation to the DNSH principle) to the protection and restoration of biodiversity and ecosystems, as set in the Regulations. This should support compliance with related reporting and disclosure regulations;
- Identify potential skill gaps and propose a capacity building strategy to tackle them;
- Provide economic actors such as investors including Investment Fund Managers, corporates and financial institutions with tools, guidance, and methodologies to gather

⁵⁸ Such as LIFE PACTA which engage ‘financial institutions, retail investors, financial regulators and civil society’ and LIFE FinACTION.

reliable, consistent and standardised data to enable incorporation of biodiversity considerations into their investment decisions and risk management processes;

- Involve actively and co-create with the end-users and stakeholders (non-financial corporations, financial institutions, governments etc.) to fully account for their respective views and needs;
- Issue recommendations at EU as well as other levels on enabling conditions for biodiversity-focused sustainable finance and accounting principles, exploring synergies with other EU initiatives, such as the Non-Financial Reporting Directive (NFRD)⁵⁹ and the Corporate Sustainability Reporting Directive⁶⁰, as well as with relevant ‘biodiversity-friendly’ labels and standards.

Actions should bring together from the start multiple types of scientific expertise in social sciences and humanities, in particular in economics and finance, as well as scientific expertise in biodiversity and natural capital.

Actions should envisage clustering activities with the project(s) of the same topic and relevant topics on sustainable finance and valuation of ecosystem services⁶¹. To this end proposals should foresee dedicated tasks and appropriate resources for coordination measures, foresee joint activities and joint deliverables.

HORIZON-CL6-2023-BIODIV-01-10: Build up of knowledge on Nature Positive Economy and supporting its scale-up

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

⁵⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0095>. Adopted by the Commission in April 2021, a new proposal will extend the scope of the NFRD to all large companies and all companies listed on regulated markets (except listed micro-enterprises) and will introduce more detailed reporting requirements that are coherent with the Taxonomy’s concept of SC and DNSH. <https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=CELEX:52021PC0189>.

⁶⁰ https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en.

⁶¹ Notably Horizon Europe projects ‘SELINA’ and ‘Invest4Nature and projects resulting from the calls: ‘HORIZON-CL6-2021-BIODIV-01-07: Ecosystems and their services for an evidence-based policy and decision-making’, ‘HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities’ , ‘HORIZON-CL6-2024-BIODIV-01-4: Biodiversity, economics and finance: Understanding macro-financial risks associated with biodiversity loss’, ‘HORIZON-CL6-2023-BIODIV-01-10: Build up of knowledge on Nature Positive Economy and supporting its scale-up’.

Expected Outcome: In line with the European Green Deal priorities, in particular the EU biodiversity strategy for 2030 and the revised climate targets, the successful proposal will support the development of policies and market conditions to scale up and accelerate the implementation of nature positive economic activities with particular focus on Nature-based Solutions (NBS). It will promote mainstreaming of biodiversity, ecosystem services and natural capital valuation in the society and economy.

Project results are expected to contribute to all of the following expected outcomes:

- Increased clarity of concepts around nature positive economy and its components, with better understanding of the synergies and trade-offs with other sustainable economic activities, such as a circular and sustainable bioeconomy⁶², and the interactions with the EU sustainable finance taxonomy;
- New knowledge and increased expertise of relevant stakeholders in both public and private sectors, including economic and financial decision makers, on the market and determinants of nature positive activities with NBS at the core;
- Creation of an EU community of ‘nature-based enterprises’ as a basis for promoting EU global leadership;
- New enabling policy, regulations, support, tools, and capacity building measures, addressing market barriers, and leading towards better integration of innovative nature-based entrepreneurship and nature-based solutions in the current economic and financial system;
- Support to the implementation of the EU biodiversity strategy for 2030, the new EU climate adaptation strategy, the new EU sustainable finance strategy, and increased synergies with other key policy areas in support of European Green Deal priorities.

Scope: The EU biodiversity strategy for 2030 states that “industry and business have an impact on nature, but they also produce the important innovations, partnerships and expertise that can help address biodiversity loss”. From the perspective of the private sector, integrating natural capital and biodiversity considerations into their decision-making processes makes economic sense as it can enhance corporate resilience and minimise investment risks. At the same time, economic activities that aim at reversing of biodiversity loss can create positive outcomes for the society such as job creation and sustainable economic growth in rural, post-industrial and disadvantaged areas and strengthen resilience against environmental and climate stressors, contributing to a fair and green transition and recovery in line with the European Green Deal. According to the World Economic Forum, a nature-positive recovery “can unlock an estimated \$10 trillion of business opportunity by transforming three economic

⁶² Cf. EU [Bioeconomy Strategy](#) | [European Commission \(europa.eu\)](#) and its progress report ‘Stocktaking and future developments: report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions’.

ecosystems that are responsible for almost 80% of nature loss and create 395 million resilient jobs by 2030 in the process”⁶³.

Nature-based solutions (NBS) can play a particularly key role in leveraging of the economic and societal potential of nature with the development of existing and new market sectors with ‘nature-based enterprises’ (NBEs) at the core. Such innovative NBEs use nature (and ecosystem services) as an input to deliver nature positive outputs - products, services and jobs that are sustainable, future-oriented, and more resilient. By definition, they constitute a backbone of the bioeconomy.

However, nature-positive economy where such NBEs can thrive is still at its infancy and enabling framework conditions are required to improve market conditions and to unlock investment. The market is encountering many specific difficulties due to market fragmentation, early stage of development and difficulty in assembling the required knowledge, skillset, and governance structures for supplying and maintaining “living solutions” such as nature-based solutions. There is a need at the same time to increase manifold the investment in NBS⁶⁴.

The action should:

- On Concept: Undertake in-depth research into the key concepts underpinning nature positive economy, establishing synergies and trade-offs with other policies, strategies, and business models such as bioeconomy related, and exploring the role of nature positive activities and NBS in promoting transformative change to provide holistic solutions that address global challenges such as climate, biodiversity, and pollution crisis;
- On Market Knowledge: Building on the work of Horizon 2020 projects and their taskforces, identify barriers and analyse market potential in different economic sectors, at European and national level when possible, for each sector, identify the stakeholders of the different value chains for the different types of nature positive economic activities, estimating the net job creation potential with a view to supporting the framing of nature positive economy narrative. This work should include identification and analysis of representative case studies and reflections on positioning towards nature positive economic activities as defined by the Sustainable Finance Taxonomy⁶⁵;
- Foster collaboration between nature-based entrepreneurs, research and technical organisations, policy makers, financiers and investors, business development bodies through, for example, participatory arrangements and spaces, to close the Science Policy Implementation gap;

⁶³ https://www3.weforum.org/docs/WEF_The_Future_Of_Nature_And_Business_2020.pdf.

⁶⁴ According to [UNEP State of Finance for Nature 2021](#), by 2030 if the world is to meet its climate change, biodiversity and land degradation targets, the investment will need to triple, unlocking in particular private finance (only 14% of the current investment).

⁶⁵ That is to say the criteria ‘Substantially Contribute’ in regards of the protection and restoration of biodiversity and ecosystems

- On Indicators: Building on previous research, notably natural capital valuation methods including both monetary and non-monetary economic valuation approaches for nature-based solutions⁶⁶, deliver progress towards standardised, widely accepted economic indicators, reflecting wider socio-economic, biodiversity and natural capital benefits;
- On Market development: using the collaborative and participatory arrangements, develop and pilot strategies, measures (both market and non-market) and approaches for scaling and speeding up the implementation of nature positive economic activities, including Nature-based Solutions (NBS), both from supply and demand side perspective to boost nature-based market development, innovation, and job creation in EU and beyond. This may comprise for market supply economic, finance and governance innovations, capacity building and training;
- Explore and facilitate synergies and interconnection with different EU, MS and Horizon Europe Associated Countries initiatives, such as: EU and national Business and Biodiversity platforms, national restoration plans, Business Acceleration Services, Climate KIC, Smart Specialisation Strategies, Recovery Plans, the EU Biodiversity Partnership, Circular Bio-based Europe Partnership, European Bioeconomy Policy Forum, for more coordinated actions and aggregated impact on NBS and nature positive activities;
- Set up and/or collaborate with relevant marketplaces and similar initiatives at the relevant scales, so that potential project partners, entrepreneurs, investors, and innovation stakeholders can match supply, demand and expertise on designing, implementing, managing, monitoring, valuing, financing NBS, ecosystem services and nature positive activities;
- On Standardisation: support the engagement of the relevant communities (including the communities engaged in the relevant Horizon 2020, Horizon Europe and LIFE projects) in contributing to the development of sector-specific standards and/or certification schemes;
- Build on and/or establish synergies with the relevant work by initiatives/projects/studies including, but not limited to, the EIB led study on facilitating access to finance for Nature-based solutions, the EC publication ‘The vital role of NBS in the Nature-Positive Economy’⁶⁷, the World Economic Forum’s New Nature Economy Report Series, The Economics of Biodiversity: The Dasgupta Review, The State of Finance for Nature 2021⁶⁸;

⁶⁶ The published [EC Handbook](#) on evaluating the impact of NBS provides a comprehensive reference point on how to measure different types of impact. There are also many Horizon 2020 and Horizon Europe projects on Natural Capital, as well as LIFE projects (e.g. LIFE Transparent).

⁶⁷ [The vital role of nature-based solutions in a nature positive economy | European Commission \(europa.eu\)](#)

⁶⁸ [State of Finance for Nature](#) | UNEP - UN Environment Programme.

- Actions should bring together from the start multiple types of scientific expertise in social sciences and humanities, in particular in economics and finance, as well as scientific expertise in biodiversity and natural capital.

Other conditions:

Actions should envisage clustering activities with the projects with the Horizon 2020 and Horizon Europe Natural Capital Accounting and NBS project portfolio and respective task forces as well as any Horizon Europe relevant projects on NBS⁶⁹ and Bioeconomy. To this end proposals should foresee dedicated tasks and appropriate resources for coordination measures, foresee joint activities and joint deliverables.

HORIZON-CL6-2023-BIODIV-01-11: Biodiversity loss and enhancing ecosystem services in urban and peri-urban areas

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In line with the European Green Deal, in particular with the objectives of the EU biodiversity strategy for 2030 and the EU proposal for a nature restoration law⁷⁰, projects will contribute to the following impact: “to mainstream biodiversity, ecosystem services and natural capital in the society and economy”.

They should address all of the following outcomes:

⁶⁹ notably coordinate with Horizon Europe projects resulting from: HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities; HORIZON-CL6-2022-BIODIV-01-04: Natural capital accounting: Measuring the biodiversity footprint of products and organizations; HORIZON-CL6-2021-BIODIV-01-05: The economics of nature-based solutions: cost-benefit analysis, market development and funding; HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions; s, and the 2 topics HORIZON-CL6-2023-BIODIV-01-9 and HORIZON-CL6-2024-BIODIV-01-4.

⁷⁰ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022.

- Better implementation and delivery of the EU proposal for a nature restoration law and the EU biodiversity strategy for 2030, particularly through new resources and knowledge to support the deployment across EU of urban (and peri-urban) greening plans;
- Increased capacity and skills in cities to work ‘at the right scale’ of the challenge and across policies, measures, strategies, including spatial planning capacity, so as to help deliver and assess the urban greening plans, green infrastructure strategies and more widely transformative change towards more sustainable and resilient cities to implement the EU climate adaptation strategy;
- Better understanding on how and under which conditions spatial planning can help optimise the ecosystem services of the solutions, strategies and actions, such as ecosystem restoration/creation and connectivity, Nature-based Solutions (NBS), blue and green infrastructure while addressing social equity and spatial justice aspects; operating this new knowledge into new pathways and methodologies;
- New tools and solutions for better integration of nature-based objectives in investments in infrastructure and other urban systems as well as better investment cases for renaturing the urban and peri-urban areas and maintain NBS in the long-term thanks to new and innovative governance and finance models;
- Better understanding on how to manage the tension between biodiversity protection, urban development pressure and fair access to nature for the urban citizen, identifying the relevant scale and timeframe while considering the long-term impact of spatial planning strategies;
- New approaches, tools and good practices for decision-making processes supporting municipal planning structures in co-creation of policies and plans for NBS through the lens of social equity and environmental fairness.

Scope: Cities with their peri-urban areas have a vital role in protecting and enhancing nature and nature contribution to people in urban areas across EU, such as health, well-being, and climate resilience. They are also key in delivering global and EU biodiversity objectives and policies, as recognised both in the ‘post-2020 Global Biodiversity Framework (GBF) Draft 1’⁷¹ and in the ‘EU biodiversity strategy for 2030’⁷², as well as in the proposal for a nature restoration law⁷³ which sets targets for urban and peri-urban ecosystems.

⁷¹ Cf. enabling conditions: ‘The implementation of the global biodiversity framework requires integrative governance and whole-of-government approaches to ensure policy coherence and effectiveness, political will and recognition at the highest levels of government. It will require a participatory and inclusive whole-of-society approach that engages actors beyond national governments, including subnational governments, cities and other local authorities (including through the Edinburgh Declaration)’ and CBD/SBI/3/INF/25 as well as future CBD Decision on the updated plan of action on subnational governments, cities and other local authorities for biodiversity’.

⁷² Measure on bringing back nature to cities and their peri-urban areas, with greening plans to be developed by cities of more than 20 000 inhabitants.

⁷³ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

Cities are at the same time pledging for a recognition of their pivotal role(s) in delivering an ambitious GBF, with more than 200 sub-national authorities having signed the Edinburgh Declaration⁷⁴: as decision makers and regulators for land-use and urban development through their statutory role in spatial planning; as land and infrastructure (grey and green) owner, manager or shareholders, such as brownfields and public spaces, including natural and protected areas; as co- initiators and co-funders of local green initiatives, from urban gardening to depaving doorsteps and to the implementation of large-scale NBS.

There is however a lack of knowledge and know-how on:

- how to assess ecosystem condition and services in urban and peri-urban areas, and their contribution to the challenges of the cities,
- how to best plan and prioritise the protection, renaturing, and reconnecting of the NBS and green and blue infrastructure so as to optimise the ecosystem services and address the policy priorities of the city while ‘leaving no one behind’ as stressed by the European Green deal (e.g., promote urban and regional resilience, while addressing spatial justice to avoid increased inequality),
- how to combine, connect and manage different re-naturing actions and interventions and the scales of these actions- from an individual intervention to an urban and functional urban area in order to minimise the trade-offs and disservices and optimise the benefits in a cost effective and efficient manner.

The successful proposal should:

- Building on the work of Horizon 2020 projects and their task forces, take stock of the **state** the existing urban and peri-urban ecosystems and their services and identify direct (urban development pressure etc.) and indirect drivers of loss of biodiversity and ecosystem services at local level (policy, spatial regulations, financial incentives, land management practices, etc.);
- Develop a replicable methodology for cities and urban areas across Europe to co-design pathways, a shared long-term vision, an integrated strategy with policies and an action plan (e.g., with responsibilities, timeline and financing) towards the urban ecosystem restoration targets as formulated in the Commission proposal for a nature restoration law⁷⁵;
- Include in the methodology the necessary mapping and assessment methods, economic and co-creation governance models to co-develop and prioritise i. combination of **cost** effective and efficient solutions that will enable to co-implement the strategy and to co-monitor the delivery; ii. innovative solutions and governance models to integrate systematically the strategies in the public, private and people decision making processes,

⁷⁴ Edinburgh Declaration on post-2020 global biodiversity framework, available at: <https://www.gov.scot/publications/edinburgh-declaration-on-post-2020-biodiversity-framework/>.

⁷⁵ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

such as public procurement, transport and climate policies, spatial regulations, land management decision, market incentives, etc; iii. innovative financing and business models;

- Co-develop and test the methodology in a representative sample of cities across EU with local stakeholders from the whole society that will enable the uptake of the models and tools developed across EU and EU regions, thus supporting EU territorial cohesion;
- Engage in the testing cities different departments of local authorities, local research and technical organisations, big urban/ land managers or users, including farmers, citizen, including vulnerable groups, SMEs such as nature-based enterprises, etc. Citizen science approach could be used for this purpose;
- Identify the skills and building capacity needs at the local and regional levels, the potential for job creation as well as existing capacity building programmes, with an eye at the inclusion of marginalised communities and at the gender dimension;
- Propose how urban greening plans and spatial planning, including regulations and building code, can act as enablers of the development of NBS market;
- Disseminate outcomes and capacity building activities across EU, connecting with the relevant platforms such as recommended in the EU guidance for urban greening plans, as well as with the “Cities with nature platform”⁷⁶;

Proposals should also:

- Build on existing methods and data from the Urban Greening Plan guidance and toolbox, including JRC MAES urban, EPSON studies, EEA data on green infrastructure;
- Build on the outcomes of the relevant EU-funded projects of the Horizon 2020 and LIFE Programmes⁷⁷, including further testing and developing of the EU Impact Evaluation Framework for NBS⁷⁸ and similar highly relevant protocols and guidelines;
- Envisage clustering activities with the relevant Horizon 2020 NBS projects and respective task forces as well as with relevant Horizon Europe projects⁷⁹ and relevant

⁷⁶ The formally constituted Advisory Committees to the CBD on Local Governments and Biodiversity has ICLEI as the Secretariat. The committees’ main objectives are to coordinate the contribution and participation of all levels of subnational government in processes under the CBD and to act as an advocacy platform for enhanced cooperation between CBD Parties and all levels of subnational government. One of the implementation-orientated platforms is “Cities With Nature”, which act as multi-stakeholder platforms at the local level for learning, measuring and commitments, as well as tracking and reporting on these commitments.

⁷⁷ Such as ‘LIFE UrbanGreeningPlans’.

⁷⁸ The [EC Handbook](#) on evaluating the impact of NBS provides a comprehensive reference point on how to measure different types of impacts.

⁷⁹ Such as Horizon Europe project NaturaConnect (Horizon-CL6-2021-BIODIV-01-08) and projects stemming from the calls: ‘HORIZON-CL6-2022-BIODIV-01-07: Ecosystems and their services for an evidence-based policy and decision making’, ‘HORIZON-CL6-2022-COMMUNITIES-02-02-two-stage: Developing nature-based therapy for health and well-being’, ‘HORIZON-CL6-2021-BIODIV-01-05: The economics of nature-based solutions: cost-benefit analysis, market development and

successful projects resulting from calls of the EU Missions “Climate-Neutral and Smart Cities” and “Adaptation to Climate Change”;

- The use of social science and humanities methods and of social innovation is encouraged to encounter also different perceptions, values, experiences, practices, and social production across all stages of urban planning and to contribute to the empowerment of citizens.

HORIZON-CL6-2023-BIODIV-01-12: Reinforcing science policy support with IPBES and IPCC for better interconnected biodiversity and climate policies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: Legal entities established in non-associated third countries may exceptionally participate in this Coordination and support action in a capacity other than as an associated partner. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁸⁰ .

funding’, ‘HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions’; HORIZON-CL6-2024-BIODIV-02-2-two-stage: Demonstrating the potential of Nature-based Solutions and the New European Bauhaus to contribute to sustainable, inclusive and resilient living spaces and communities’.

⁸⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Expected Outcome: In line with the Commission priority 'A stronger Europe in the world', a successful proposal will step up EU science policy support to biodiversity policy at EU and international level, and in particular the interconnections with climate policies⁸¹. This will require the contribution to processes triggered by the EU and global biodiversity knowledge centres, IPBES and IPCC to achieve targeted impacts on biodiversity-relevant policies, and to integrate structured policy input into the research cycle. Projects should deliver the following outcomes:

- EU projects and initiatives are aware of and use the knowledge generation, policy support and capacity building functions of IPBES, including the recommendations issued by task forces of IPBES and IPCC (where relevant for biodiversity);
- Contribution of and uptake by research projects and initiatives reinforcing the evidence base of EU biodiversity and climate policy by promoting synergies and avoiding conflicts, as well as taking into account the knowledge generation, policy support and capacity building functions of IPBES, in line with the recommendations issued by the task forces of IPBES and IPCC;
- Address shortcomings in the uptake of IPBES and IPCC findings and conclusions in sectorial policy making other than for biodiversity, and business decisions at European, national and local level;
- Better support from EU research for policy requests to the EU and global Knowledge Centres for Biodiversity and to the European contribution to IPBES.

Scope: In line with the Commission's priority 'A stronger Europe in the world', the European Union must take and demonstrate leadership in this field, notably by increasing its support to the EU and global biodiversity knowledge centres⁸² and to IPBES – and to elevate it to the same level as the IPCC.

- Besides economic support, this also includes networking efforts to reinforce synergies and cooperation of the work of EU services, scientists and practitioners with CBD, IPBES, regional Multilateral Environmental Agreements, UN organisations and programmes, and other relevant research communities to underpin the implementation, monitoring and review of the post 2020 global biodiversity framework.
- This action delivers targeted support to areas of specific interest for European research policy by using as well as contributing to IPBES outputs. It also helps European scientists, in particular those from southern, central and eastern EU countries, and those from the Western Balkans, Central Asia, and from Africa⁸³, who remain underrepresented, due to a lack of capacity to participate in meetings, networking or science input at global level, to play their role by contributing to EU and global regular

⁸¹ Considering Horizon Europe Cluster 5 – Destination 1 “Climate Science and Responses”.

⁸² The EU Knowledge Centre for Biodiversity is available at https://knowledge4policy.ec.europa.eu/biodiversity_en.

⁸³ Europe and Central Asia form one region for IPBES purposes. Cooperation with Africa is a priority for the policy agenda of the European Union.

assessments (EU ecosystem assessment, IPBES global assessments, Gap and Stocktake Reports, global biodiversity outlook). Major functions of IPBES still need to be further developed to achieve a proper level of uptake in Europe: knowledge generation, policy support and capacity building functions, including the task forces.

The project should cover all of the following points:

- providing assistance to the EU and Associated Countries, to central Asian and to African scientists, knowledge holders and local communities for reinforcing the input into the EU and global biodiversity knowledge centres, IPBES and IPCC on biodiversity;
- translating IPBES and other relevant research outputs for policy and decision-making into a language targeted to a wider readership by the EU public, interest groups, research and innovation projects, policy makers and businesses, and into (a set of) EU languages;
- networking and facilitating synergies through cooperation between IPBES, IPCC and amongst scientists and relevant scientific bodies of other regional Multilateral Environment Agreements, such as the United Nations Economic Commission for Europe (UNECE) Air Convention;
- proposing standards for EU-funded biodiversity projects to apply the relevant outcomes of the IPBES data and knowledge task force;
- supporting European negotiators at IPBES plenary meetings and inter-sessional work as well as at the scientific body meetings of CBD and other biodiversity-related MEAs of relevance to IPBES. This includes back-office support to the EU IPBES and IPCC negotiation teams and to delegations of Member States and Associated Countries in need of assistance in synthesizing scientific evidence of relevance for IPBES and IPCC plenary work.

The project should detail a plan on how the work can be further financed and governed over the medium- and long-term and secure commitments that enable the work to continue after the funding of this topic ends.

Proposals should not develop any new platforms but ensure that all relevant evidence, data and information is accessible through e.g., the Oppla portal and cooperate with existing networks of national platforms⁸⁴. They should also prepare the inclusion of their results in the EC Knowledge Centre for Biodiversity, hosted by the Joint Research Centre (JRC), according to an agreed format, and cooperate with the Science Service project 'Bio-Agora'.

The project is to set a clear plan on how it will collaborate with other projects selected under related topics of the Cluster 6 Work Programmes 2021-245, and with the Biodiversity Partnership Biodiversa+. This includes links to ESFRI research infrastructures, to test whether they could host predictive models, visualization and analysis of their platform's early warning systems, to respond to IPBES and IPCC assessments and to CBD requests, by participating in

⁸⁴ The network of national platforms in Europe & Central Asia for the IPBES, <http://www.ipbes.eu>.

joint activities such as workshops, scientific deliverables, or joint communication and dissemination measures. Proposals should include dedicated tasks and allocate sufficient resources for coordination measures and indicate the necessary flexibility to react to requests stemming from future IPBES and IPCC work programme development.

Proposals should involve the contribution from the social sciences and humanities disciplines.

Biodiversity friendly practices in agriculture, forestry and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-13: Crop wild relatives for sustainable agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: Activities under this topic seek to preserve biodiversity and thereby contribute to the objectives of the EU biodiversity strategy for 2030 and the upcoming post 2020 global biodiversity framework. By increasing agrobiodiversity, activities will contribute to food security, adaptation of the agricultural production to the effects of climate change, and thereby support implementation of the farm to fork strategy, the common agricultural policy and the EU climate policy under the European Green Deal.

Projects funded under this topic are expected to contribute to all of the following outcomes:

- More effectiveness measures for the conservation of Crop Wild Relatives (CWR) due to increased knowledge and systematic monitoring and documentation of the diversity, the threats and the conservation status of CWR;
- Conservation of CWR is improved due to a) better coverage of CWR in gene banks, b) the establishment of genetic reserves for in situ conservation, and c) enhanced genetic characterisation of CWRs;

- Knowledge on valuable traits, such as tolerance to biotic and abiotic stresses or nutritional properties is more easily available to breeders and accelerates the breeding of more resilient crop varieties;
- Greater use of CWR in pre-breeding and breeding activities, both in formal and on-farm crop improvement programmes;
- Farmers are more aware of the value of CWRs and have improved access to varieties and cultivars with high resilience and/or adapted to marginal lands.

Scope: Crop Wild Relatives (CWR) – also referred to as the wild cousins of cultivated crops - are a key asset for agrobiodiversity, sustainable agriculture and food security overall. CRWs contain genes for a multitude of useful traits such as tolerance to pest and diseases, resource efficiency and adaptability to more extreme weather conditions or nutritional quality. Their inherent genetic diversity together with the associated diversity of microbiota is a vast resource for developing more productive, nutritious and resilient crop varieties and for diversifying farming systems.

Despite their value, a wide range of CWRs are threatened and face pressures, e.g., from intensive agriculture, urbanisation, pollution and the effects of climate change. At the same time, the conservation and use of CWRs in breeding lags significantly behind the one of main crops. It is estimated that for about 30% taxa associated with 63 crops, no germplasm accessions exist and that about 95% of CWR taxa are underrepresented in genetic resources collections. As a consequence, knowledge is lacking about the diversity that exists and precisely how that diversity may be used for crop improvement and in farming.

More systematic efforts are needed to improve the conservation of CWR in –situ and ex-situ and increase their use in plant breeding and farming.

Proposals should:

- review and increase our knowledge on the diversity, the conservation status (both in situ and ex situ), the threats, monitoring and the utilization of CWR in Europe; due account should be taken of the local knowledge of farmers, e.g., as regards the specific attributes of CWR resources, their integration in agro-ecosystems and methods for their management on-farm;
- promote the breath of taxa and genetic diversity of CWR in gene bank collections and improve their description and geno- and phenotypic characterisation;
- set-up pilots of genetic reserves for CWR under different types of management regimes and pedo-climatic conditions, and develop models for their long-term viability;
- unravel the genetic basis of valuable traits of CWR such as the resilience to different biotic and abiotic stresses or nutritional quality;

- develop high-quality genomic resources to promote the use of CWR in pre-breeding and breeding activities of formal and on-farm crop improvement programmes;
- promote the on-farm management and conservation of CRW genetic resources taking into account the adaptation of CWR to local conditions;
- carry out training activities and increase awareness of breeders, farmers, consumers and the various actors in value chains (e.g., the agri-food industry) about the value of CWR, including by carrying out on-farm demonstrations.

Work under this topic should be carried out in various pedo-climatic zones⁸⁵ and benefit both conventional and organic farming as reflected in the expertise of the consortia. Proposals must implement the “multi-actor approach”, and build partnerships across research, conservation, breeding, farming and business sectors, considering a balanced representation of partners from within the EU and Associated Countries. They should also demonstrate a sound representation of SSH disciplines.

HORIZON-CL6-2023-BIODIV-01-14: Biodiversity friendly practices in agriculture – breeding for Integrated Pest Management (IPM)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the objectives of the European Green Deal, the EU Climate Policy, EU biodiversity strategy for 2030 and the farm to fork strategy, a successful proposal will contribute to the transition to more sustainable practices in agriculture by reducing the need for external inputs, notably chemical pesticides⁸⁶, and support biodiversity in agroecosystems.

Projects are expected to contribute to all of the following outcomes:

⁸⁵ <https://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-2>

⁸⁶ The farm to fork strategy sets the target to reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides

- Enhanced knowledge of relevant traits for resistance and/or tolerance (resilience) to biotic stresses;
- Enlarged availability and access to plant varieties which can better cope with increased pest and diseases pressure;
- Increased knowledge, knowledge transfer, and capacity of farmers and agricultural advisers to implement Integrated Pest Management with plant varieties that can better cope with plant pests and that are adapted to the local environmental and pedo-climatic conditions (e.g., terroir effects, soil health status, local disease pressures, positive interactions with biological control) and farming practices (e.g., intercropping, crop rotation, carbon farming).

Scope: The European Green Deal has set ambitious targets to reduce by 2030 the use and the risk of chemical pesticides and fertilisers, reduce nutrient losses and increase organic farming⁸⁷. Plant breeders need to consider more systematically characteristics that respond to these demands and contribute to crop resilience and adaptation, particularly to increasing biotic and abiotic stresses, in particular in the context of climate change.

Breeding for integrated pest management (IPM) aims to boost the development of plant varieties with tolerance of or resistance to relevant pest(s)⁸⁸ and diseases, adapted to local environmental and pedo-climatic conditions, and diversification approaches with the goal of reducing reliance on chemical pesticides.

Proposals should:

- Contribute to a better understanding of crop-specific genetic characteristics and crop-environment management (GxExM) interactions underpinning tolerance to pest pressure;
- Identify useful traits/combination of traits and progress in the development of plant varieties with increased resistance or tolerance to plant pests and adapted to local conditions;
- Embark in breeding activities for pest-tolerant or pest-resistant varieties making use of all type of breeding approaches and allow for participatory breeding with involvement of farmers;
- Promote the deployment of resistant plant varieties in combination with the range of tools available for integrated pest management such as crop diversification, soil and crop management (e.g., crop residue management), biological control agents (e.g., micro- and macro-organisms), the preservation and enhancement of natural enemies of plant pests

⁸⁷ European Green Deal farm to fork and biodiversity strategies with 2030 targets: reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides; reduce nutrient losses by at least 50% while ensuring no deterioration in soil fertility; reduce the use of fertilisers by at least 20%; achieve at least 25% of the EU's agricultural land under organic farming.

⁸⁸ A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

(e.g., beneficial insects/mites/nematodes/antagonistic, symbiont microorganisms, beneficial endophytes);

- Support capacity building, training and education enabling farmers/growers to adopt sustainable agricultural practices in pest management following the integration of tolerant plant varieties;
- Increase general awareness of the benefits of IPM and the adoption of resistant plant varieties for consumers and in the value change.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of researchers, the breeding sector, farmers, advisors and other relevant actors of the value chain. The topic is open to all types of farming systems (e.g., arable farming, horticulture, fruit trees). Proposals should cover various biogeographical regions⁸⁹ with a balanced coverage reflecting the various pedo-climatic zones in Europe in a representative way. Result of activities should benefit both conventional and organic farming.

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics, for example by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

HORIZON-CL6-2023-BIODIV-01-15: Integrative forest management for multiple ecosystem services and enhanced biodiversity

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>Legal entities established in non-associated third countries may exceptionally participate in this Coordination and support action in a capacity other than as an associated partner.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>

⁸⁹ <https://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-2>

	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁹⁰ .

Expected Outcome: In line with the European Green Deal, EU climate policy, and the EU forest and biodiversity strategies, this topic promotes research-based and evidence-based forest conservation and management approaches that apply an understanding of the structure, function, and dynamics of natural and sustainably managed forest ecosystems to achieve integrated environmental, economic, and social outcomes.

Project results are expected to contribute to all of the following outcomes:

- Intensive collaboration, mutual learning and sharing of knowledge among the conservation and forestry bodies, forest managers, research institutions and other interested stakeholders to exploit synergies and minimise trade-offs in forest management.
- Contribution to the development of computer models to be used as operational tools for examining the effects of climatic change on forest functioning.
- Practical recommendations and guidelines addressing multiple, possibly conflicting objectives of forest management, to promote forest conservation and resilience and mitigate the impacts of various forest disturbances, while supporting the socio-economic goals of forests through the support of an efficient utilisation of forest resources and services.
- Contribution to the achievement of EU forest related policy targets (biodiversity, bioeconomy, climate mitigation and adaptation).
- Diversification of forest management methods and their mutual balance and appropriate use in the given context (“context-dependent integrative forest management”) through the combination of different scientific disciplines, strong involvement of practitioners, researchers and advisors, biodiversity monitoring systems based on expert taxonomic knowledge combined with technologies, decision support tools and sustainability

⁹⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

indicators. Application of context-dependent and site-appropriate, multi-stakeholder participatory and interdisciplinary methods.

- Enhanced knowledge on ecological forestry practices and their impacts on climate change adaptation and biodiversity conservation/restoration.

Scope: This topic addresses integrative forest management strategies that optimise actively managed forest ecosystems in such a way that the ecological and socio-economic functions are sustainable and economic viable.

The aim is to achieve a better understanding how integrative forest management concepts (e.g. close-to-nature forestry, continuous cover forestry, retention forestry, etc.) are currently applied in Europe, their implications on the environment and biodiversity, society, and forest-based economy as well as to accelerate the implementation of innovative approaches through targeted and evidence-based guidelines and tools.

Proposals should:

- Provide an in-depth analysis of current concepts and principles of integrative forest conservation, management and utilisation strategies and assess their socio-economic and ecological impacts;
- Establish a network of living labs for integrative forest conservation, management and utilisation approaches inspired by best practices and covering different socio-cultural and bio-geographical conditions;
- Develop applicable evidence-based guidelines and tools for the upscaling of integrative forest conservation, management and utilisation approaches;
- Consider a strong stakeholder involvement and supportive policies;
- Support exchange of knowledge, dialogue and good practices among stakeholders and institutions, including science-based dialogues.

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain.

Due to the scope of this topic, international cooperation is strongly encouraged, in particular with China. This topic is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

Actions will contribute to implementing the EU-China Food, Agriculture and Biotechnology (FAB) flagship initiative, which aims to ensure sustainability of agri-food systems, catering for the needs of a growing population, the reduction of food and agricultural losses and waste, and the provision of safe and healthy foodstuffs. Interaction with other actions developed

under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and the Flagship on Food, Agriculture and Biotechnologies (FAB) is encouraged if relevant.

JRC is available for sharing and taking up results and findings on the monitoring of the forest ecosystem multifunctionality in the EU Observatory for Deforestation, Forest Degradation and Associated Drivers and JRC Big Data Analytics Platform.

HORIZON-CL6-2023-BIODIV-01-16: Valorisation of ecosystem services provided by legume crops

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy, the EU biodiversity strategy for 2030 and the EU zero pollution ambition, the successful proposal will promote sustainable, productive, climate-neutral, environment-friendly and resilient farming systems, which would provide consumers with affordable, safe, traceable, healthy and sustainable food while increasing the provision of ecosystem services.

The farm to fork strategy states that ‘[a] key area of research will relate to (...) increasing the availability and source of alternative proteins such as plant, microbial, marine and insect-based proteins and meat substitutes’. The ambitious targets in the farm to fork strategy on the reduction of fertilizer use by at least 20% by 2030 and on reaching at least 25% of EU agricultural land under organic farming by 2030 will also create a favourable environment for the development of EU-grown protein plants which naturally enrich the soil reducing the need for synthetic fertilisers. Most recently, the Versailles declaration⁹¹ also highlighted the importance of increasing EU plant-based proteins as a means of reducing the EU’s dependency on key imported agricultural products and inputs and improving food security.

The new common agricultural policy (CAP) put into practice eco-schemes that can provide support for longer rotation cycles with environmentally beneficial crops such as leguminous

⁹¹ [20220311-versailles-declaration-en.pdf \(europa.eu\)](https://ec.europa.eu/euro-observatory/sites/default/files/20220311-versailles-declaration-en.pdf)

crops. Other instruments that benefit protein crops under the new CAP are sectoral interventions, investment subsidies under rural development programmes and coupled income supports.

Activities will also support the implementation of the action plan for the development of organic production.

Proposals results are expected to contribute to all of the following expected outcomes:

- Improved quantification, in environmental and economic terms, of the ecosystem services provided by legume crops, including those related to soil biodiversity and fertility.
- Increased knowledge and capacity of farmers and agricultural advisers to include minor and major legume crops in their cropping schemes with a positive ecological and economic impact.
- Diversified farming practices throughout the EU and Associated Countries, where legume crops contribute to healthier and sustainable diets, resilience to climate change and increase of agrobiodiversity.

Scope: The European Union and Associated Countries' arable agricultural systems are often characterised by short rotations or monocultures, leading to problems such as higher pest pressure, soil erosion, loss of soil fertility or loss of biodiversity. As a result, there is an imperative need to reveal the full potential of diversification of cropping systems, with the aim of improving productivity, and supporting the development of resource-efficient and sustainable value chains. Protein-rich plants, and in particular legumes, play a key role in cross-cutting issues related to crop rotation, sustainable soil management and closing nutrient cycles. They have the potential to enable the environmental sustainability, productivity, climate neutrality and resilience of farming systems, by increasing the provision of ecosystem services while restoring and enhancing biodiversity and generating fair economic returns for farmers.

The environmental, nutritional and economic benefits that leguminous crops bring to all players of the value chain, provide an opportunity for further developing the leguminous crop sector in the EU and Associated Countries. This could eventually contribute to reducing the EU's dependency on imports of nitrogen fertilisers and protein crops for feed, while support meeting the objectives of farm to fork strategy.

While the direct benefits of legume crops as food and feed are usually recognized, their environmental and economic benefits derived from the increase of the provision of the ecosystem services they provide, are less understood and not valorised. The focus of this proposal is on the economic and environmental benefits of the production of legume crops, regardless their cultivation purpose is for food or for feed uses.

Proposals should:

- Increase knowledge on the different and complementary benefits from the use of legume crops (both annual and perennials) in the provision of ecosystem and environmental services, such as the value of the nitrogen transfer to succeeding or companion crops (including in grassland systems), the efficiency of different legume varieties to fix nitrogen in the soil in function of specific conditions (e.g., soil type, established rhizobia consortia), the role of legume crops for wind protection, water runoff or other erosion control strategies.
- Explore new synergies between combinations of legume crops and other crops that can benefit from nitrogen fixation, in systems like crop rotations, intercropping, mixed cropping, cover cropping or agroforestry.
- Evaluate the global competitiveness of legume crops cultivation in different contexts of the EU and Associated Countries (considering relevant economic, social or environmental aspects) through a cost-benefit analyses and life-cycle environmental assessment, versus imports from third countries.
- Develop tools or methods that allow to measure and quantify in economic terms the value of the nitrogen transfer between various crops, for different crop combinations, in relation to environmental aspects such as the reduction of use of nitrogen fertiliser, carbon emissions, pollution, nitrogen losses, reduced GHG emissions, pest/weed/disease management and increased crop and microbial diversity.
- Identify and remove the barriers to crop diversification or to crop rotation. Provide indicators so that farmers and advisors are better equipped to evaluate the benefits of growing legumes, including for weed management, as well as recommendations to strengthen crop diversification and longer rotation cycles with environmentally beneficial crops.
- Promote the engagement of downstream actors in new value chains based on crop diversification. This should facilitate the market penetration of leguminous crops, linked to market outlets and consumers demand and influence the transition towards more sustainable and healthy food and feed systems.
- Include minor or underutilised legume crops (mostly perennial but also annual varieties) that are not the frequent objects of research activities. Consider their potential for enhancing the ecosystem and economic services not only due to their key role in sustainable soil management and closing nutrient cycles (likewise major legume crops) but also due to their adaptation to agroecological niches/marginal area and capability to withstand abiotic and abiotic stress and climate change.
- Generate capacity building material, organize trainings or knowledge sharing activities, including the development of guidelines (e.g. booklets, decision-support tools) to foment the dissemination, uptake and upscale of results.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this or other topics (i.e. but not limited to projects funded under topic HORIZON-CL6-2021-FARM2FORK-01-02 and HORIZON-CL6-2022-BIODIV-02-02-two-stage), and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe such as the upcoming partnership on agroecology⁹² and the Mission “A Soil Deal for Europe”⁹³. Proposals should also seek potential synergies with and capitalise on the results of past or ongoing projects both in the EU and beyond (e.g., Horizon 2020 projects LegValue⁹⁴ and TRUE⁹⁵, the thematic network 'Legumes Translated'⁹⁶ or SusCrop ERA-NET project⁹⁷).

Proposals should benefit both the conventional and the organic farming sectors.

In order to achieve the expected outcomes, international cooperation is encouraged. This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Biodiversity and health

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-17: Interlinkages between biodiversity loss and degradation of ecosystems and the emergence of zoonotic diseases

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the

⁹² ‘European Partnership accelerating farming systems transition: agroecology living labs and research infrastructures’ at: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/european-partnerships-horizon-europe/candidates-food-security_en

⁹³ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/soil-health-and-food_en

⁹⁴ www.legvalue.eu

⁹⁵ www.true-project.eu

⁹⁶ www.legumestranslated.eu

⁹⁷ <https://www.suscrop.eu/projects-first-call/legumegap>

	consortium selected for funding.
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Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, projects will develop knowledge on the links between the degradation of ecosystems with its associated biodiversity loss and the exposure to, emergence and spread of zoonotic diseases to humans. This will compliment other initiatives by addressing the biodiversity and health nexus with a focus on the effects of biodiversity loss and degradation of ecosystems on the emergence of zoonotic diseases in the context of climate change and globalization.

Proposals are expected to contribute to all of the following expected outcomes:

- Better understand the relation between the degradation of ecosystems with its associated biodiversity loss, including both macro-organisms (e.g. insects, animal and plants) and environmental and host-associated microbiomes (e.g. micro algae, fungi, bacterial and virus) and the emergence of zoonotic diseases, focusing on how human drivers for biodiversity loss, such as illegal wildlife trade, land use change in biodiversity hot-spot regions, food consumption, use of antimicrobial agents, etc. interact with the spread of zoonotic diseases.
- Understand under which conditions and at what scale the protection of biodiversity and the restoration of ecosystems can contribute to mitigate the emergence and spread of zoonotic diseases.
- Better understand the socio-economic and behavioural factors that will lead to the development and implementation of improved policies on mitigating the risk of emergence and spread of zoonotic diseases. This should also include the ecology and behavioural traits of those animals which play a role in the spread of zoonotic diseases.
- Based on this knowledge, propose practical strategies to minimize the emergence and spread of zoonotic diseases through addressing biodiversity loss.
- Better understand the biodiversity – health nexus and identify biodiversity relevant parameters and propose the necessary monitoring schemes for further integration into the One Health approach with specific focus on emerging zoonotic diseases. This monitoring should contribute to the establishment or improvement of early detection and warning systems on risks of emerging zoonotic diseases.
- In collaboration among the projects to be funded, create a knowledge platform for a) sharing information on relevant research activities and results concerning the prevention of zoonotic disease emergence in relation to biodiversity; and b) reinforcing the communication and coordination between academics, innovators, end-users, researchers, public health and environmental authorities and citizens in order to create the strong system needed for the prevention of the emergence of zoonotic diseases. This platform should be a joint deliverable between the projects to be funded and will be expected to coordinate the research activities which aim to understand and mitigate the risks of

zoonotic disease emergence in relation to the degradation of ecosystems with its associated biodiversity loss, allowing closure of current gaps and break down of existing silos. Proposals should dedicate appropriate resources to develop this joint deliverable in cooperation with the other project/s funded under this topic.

Scope: Zoonotic diseases, which result from cross-species transmission of pathogens between animals and humans, appear to emerge more frequently and pose significant threats to the health and welfare of people across the planet. Without the necessary scientific information and evidence on the underlying causes and drivers of this more frequent emergence, the only way of responding to them is after their emergence and spread.

Over the last decades, research has indicated that biodiversity loss and the linked degradation of ecosystems could simultaneously increase human exposure to existing pathogens, as well as increase of the probability of the emergence and spread of infectious diseases. Unsustainable exploitation of biodiversity, land-use change, illegal wildlife trade and consumption, together with the impacts of climate change and use of antimicrobial agents, increase the contact between humans and wildlife that consequently lead to the more frequent occurrence of emerging infectious diseases, of which around 75% are of zoonotic origin.

The high risks of these infectious diseases demonstrate the need for a real paradigm shift: preventing the emergence and spread of infectious zoonotic diseases by focusing on the root causes and underlying mechanisms potentially linked to biodiversity loss and degradation of ecosystems and improving their prediction and early detection.

This topic aims to identify and understand better the interlinkages between biodiversity loss with the linked ecosystem degradation and the emergence of zoonotic diseases. Further research is needed to better understand how the different drivers that lead to biodiversity loss and ecosystem degradation, and how the protection of biodiversity and the restoration of ecosystems may influence the emergence and spread of zoonotic diseases. Also better understanding is needed on how the conservation of animal and microbiome genetic resources may influence the emergence of zoonotic diseases.

The better understanding of these interlinkages will help to establish better prediction and early detection systems, will enhance the coordination between all relevant stakeholders, ensure fast information sharing and early response and hence reduce the spread of zoonotic diseases.

The topic should contribute to better understanding the biodiversity – health nexus and help towards an enhanced integration of biodiversity parameters and monitoring with the One Health approach.

The development of methods and identification of indicators to monitor the relevant biodiversity parameters will be essential as well as the establishment of baselines of these parameters.

The mitigation strategies in relation to biodiversity loss and ecosystem degradation to be proposed should take into consideration all the aforementioned information and findings. The

better understanding of the socio-economic and behavioural factors, as well as the involvement of local communities and environmental, animal and human health stakeholders is crucial for the preparation of these strategies.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under the same field and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, such as:

- HORIZON-CL6-2021-BIODIV-01-11: What else is out there? Exploring the connection between biodiversity, ecosystem services, pandemics and epidemic risk;
- HORIZON-CL6-2021-FARM2FORK-01-18: One Health approach for Food Nutrition Security and Sustainable Agriculture (FNSSA);
- HORIZON-HLTH-2021-ENVHLTH-02-03: Health impacts of climate change, costs and benefits of action and inaction.

To achieve the expected outcomes, the following also need to be ensured:

- Coherence and coordination with the European Partnership for pandemic preparedness, the European Partnership for One Health/AMR Antimicrobial Resistance (AMR) and the European Partnership for Animal Health and Welfare (PAHW).
- Opportunities for cooperation with relevant European or international Agencies and initiatives, such as European Food Safety Authority (EFSA), European Economic Area (EEA), European Centre for Disease Prevention and Control (ECDC), Health Emergency Preparedness and Response Agency (HERA), One Health High-Level Expert Panel (OHHLEP), One Sustainable Health, EU4Health actions (in particular One Health Surveillance), Preventing Zoonotic Disease Emergence (PREZODE), Ecohealth Alliance, etc.

The proposals should take up relevant knowledge assessed by major science-policy bodies such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC), and by the Convention on Biological Diversity. They should also take into consideration and build up on the results of the request made to EKLIPSE on Biodiversity and Pandemics. Proposals should show how their results and outcomes could provide timely information to the work of these and further relevant global initiatives.

The proposals should foresee cooperation with the European partnership on biodiversity Biodiversa+ and the Science Service “Bio-agera” and use existing platforms and information sharing mechanisms relevant to the topic. They should also contribute knowledge to the EC Knowledge Centre for Biodiversity.

In order to achieve the expected outcomes, international cooperation is strongly encouraged.

Coordination with Member States and Associated Countries should be sought out.

This topic should involve the effective contribution of social sciences and humanities disciplines (SSH).

Interconnection of biodiversity research and policies

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV-01-18: Additional activities for the European Biodiversity Partnership: Biodiversa+

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 60.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The proposal must be submitted by the coordinator of the consortium funded under HORIZON-CL6-2021-BIODIV-02-01: European partnership rescuing biodiversity to safeguard life on Earth. This eligibility condition is without prejudice to the possibility to include additional partners.</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The evaluation committee will be composed partially by representatives of EU institutions.</p> <p>If the proposal is successful, the next stage of the procedure will be grant agreement amendment preparations.</p> <p>If the outcome of amendment preparations is an award decision, the coordinator of the consortium funded under HORIZON-CL6-2021-BIODIV-02-01: European partnership rescuing biodiversity to safeguard life on Earth will be invited to submit an amendment to the grant agreement, on behalf of the beneficiaries.</p>

<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>This action is intended to be implemented in the form of an amendment of the grant agreement concluded pursuant to topic HORIZON-CL6-2021-BIODIV-02-01.</p> <p>For the additional activities covered by this action:</p> <ul style="list-style-type: none"> • The funding rate is 30% of the eligible costs. • Beneficiaries may provide financial support to third parties (FSTP). The support to third parties can only be provided in the form of grants. • Financial support provided by the participants to third parties is one of the primary activities of this action in order to be able to achieve its objectives. The EUR 60 000 threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. • The maximum amount of FSTP to be granted to an individual third party is EUR 7 000 000. This amount is justified since provision of FSTP is one the primary activities of this action and it is based on the extensive experience under predecessors of this partnership. • The starting date of grants awarded under this topic may be as of the submission date of the application. Applicants must justify the need for a retroactive starting date in their application. Costs incurred from the starting date of the action may be considered eligible (and will be reflected in the entry into force date of the amendment to the grant agreement).
<p><i>Total indicative budget</i></p>	<p>The total indicative budget for the duration of the partnership is EUR 165 million.</p>

Expected Outcome: The second instalment of the partnership is expected in continuation to contribute to expected outcomes specified in topic HORIZON-CL6-2021-BIODIV-02-01: European partnership rescuing biodiversity to safeguard life on Earth, for continuation of the activities and the continuation of already agreed outcomes.

Scope: The objective of this action is to continue to provide support to the European Partnership Biodiversa+ identified in the Horizon Europe Strategic Plan 2021-2024 and first implemented under the topic HORIZON-CL6-2021-BIODIV-02-01: European partnership rescuing biodiversity to safeguard life on Earth, and in particular to fund additional activities (which may also be undertaken by additional partners) in view of its intended scope and duration, and in accordance with Article 24(2) of the Horizon Europe Regulation.

The consortium which applied to and received funding under HORIZON-CL6-2021-BIODIV-02-01: European partnership rescuing biodiversity to safeguard life on Earth is uniquely placed to submit a proposal to continue the envisioned partnership. Not only did this consortium submit the proposal leading to the identification of the partnership in the Horizon Europe strategic planning 2021-2024, it has also implemented the partnership through co-funded calls in years 2021 and 2022 based on this planning and further to topic HORIZON-CL6-2021-BIODIV-02-01. In this context, the current consortium has particular expertise in relation to the objectives of the Partnership, the activities to be implemented in particular FSTP calls or other calls/scope of calls clearly required/envisioned pursuant to initial proposal/partnership, and other relevant aspects of the action. In practice, another consortium could not continue the activities of the Partnership underway without significant disruption to the ongoing activities, if at all.

The scope of the application for this call on the European partnership for Biodiversity Biodiversa+ should focus on the flagship programmes 2023-27 according to the partnership's co-created strategic research and innovation agenda for seven years, which includes calls for research projects, biodiversity- and ecosystems monitoring and science-based policy advisory activities, and all horizontal activities to allow the Partnership to operate and to achieve its five specific objectives.

It is expected that the partnership continues to organise joint calls on an annual base and therefore it should factor ample time to run the co-funded projects. It should build on, and widen, the data availability in European Research Infrastructures federated under the European Open Science Cloud.

The partnership should collaborate closely with the EC 'Knowledge Centre for Biodiversity' and with the Science Service project 'Bio-Agora', and seek to collaborate with EU space programmes (Copernicus, Galileo) to foster the use of emerging or operational space technologies for policy development. Moreover, the partnership should describe specific activities foreseen in order to strengthen the synergies with other related Missions and Partnerships.

While the award of a grant to continue the Partnership in accordance with this call should be based on a proposal submitted by the coordinator of the consortium funded under HORIZON-CL6-2021-BIODIV-02-01 and the additional activities (which may include additional partners) to be funded by the grant should be subject to an evaluation, this evaluation should take into account the existing context and the scope of the initial evaluation as relevant, and related obligations enshrined in the grant agreement.

Taking into account that the present action is a continuation of topic HORIZON-CL6-2021-BIODIV-02-01 and foresees an amendment to an existing grant agreement, the proposal should also present in a separate document the additional activities and additional partners, if any, to be covered by the award in terms of how they would be reflected in the grant agreement.

The partnership should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

Call - Biodiversity and ecosystem services

HORIZON-CL6-2024-BIODIV-01

Conditions for the Call

Indicative budget(s)⁹⁸

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁹⁹	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-BIODIV-01-1	IA	12.00	Around 6.00	2
HORIZON-CL6-2024-BIODIV-01-2	IA	16.00	Around 8.00	2
HORIZON-CL6-2024-BIODIV-01-3	RIA	13.00	Around 6.50	2
HORIZON-CL6-2024-BIODIV-01-4	RIA	5.00	Around 5.00	1
HORIZON-CL6-2024-BIODIV-01-5	RIA	4.00	Around 2.00	2
HORIZON-CL6-2024-BIODIV-01-6	RIA	6.00	Around 6.00	1
HORIZON-CL6-2024-BIODIV-01-7	RIA	5.00	Around 5.00	1
HORIZON-CL6-2024-BIODIV-01-8	RIA	12.00	Around 6.00	2

⁹⁸ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

⁹⁹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

*Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment*

HORIZON-CL6-2024-BIODIV-01-9	RIA	3.00	Around 3.00	1
Overall indicative budget		76.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Understanding and addressing the main drivers of biodiversity loss

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-BIODIV-01-1: Invasive alien species

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply:

	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, and one project highest ranked within the area B, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.

Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030, projects will contribute to the following impact of destination “Biodiversity and ecosystem services”: “Understand and address direct **drivers of biodiversity decline... invasive alien species...**”.

Project results are expected to contribute to all of the following expected outcomes:

- The establishment of alien species accidentally introduced in the EU environment is minimised and where possible they are eradicated,
- Early warning systems to inform relevant stakeholders of the introduction of invasive alien species, building upon EASIN,
- The introduction of invasive alien species is effectively prevented and established ones are systemically managed,
- Public awareness, literacy and engagement, on invasive alien species monitoring and management are supported and improved,
- Pressure on species on the Red List threatened by invasive alien species is reduced, contributing to the following key commitment of the EU biodiversity strategy for 2030 “a 50% reduction in the number of Red List species threatened by invasive alien species”.

Scope: Invasive alien species are one of the five main direct drivers of biodiversity loss. Besides inflicting major damage to nature and the economy, many invasive alien species also facilitate the outbreak and spread of infectious diseases, posing a threat to humans and native wildlife. The rate of new introductions of invasive alien species has increased in recent years. Without effective control measures, risks to our nature and health will continue to rise. Climate change and land-use changes facilitate the spread and establishment of many alien species and create new opportunities for them to become invasive. This topic is therefore contributing to the adaptation to climate change.

[Regulation \(EU\) 1143/2014 on invasive alien species](#) (IAS) entered into force on 1 January 2015. It establishes a [list of Invasive Alien Species of Union concern](#) (the Union list). The IAS Regulation provides for a set of measures to be taken across the EU in relation to invasive alien species included on the Union list. EASIN (European Alien Species Information Network) facilitates information on Alien Species and officially supports the EU Regulation 1143/2014.

Successful proposals should:

- Develop models based on dynamic data, accessible to end users, to prioritise species, manage pathways and sites most vulnerable by the introduction of invasive alien species;
- Develop methods for the identification, early detection and surveillance of invasive alien species, such as sensors for biophysical signals (sounds, ultrasounds, volatile organic compounds, thermal etc.), DNA-based including barcoding and application of environmental DNA, artificial intelligence, sentinel plants in ports, airports, railway stations, and logistics platforms. The use of robotics (both aerial and non-aerial), especially in marine environments, could be considered.

Proposals should address Area A: terrestrial ecosystems or Area B: aquatic (including marine) ecosystems. The Area should be clearly indicated on the application.

Proposals should build synergies with on-going projects supported under Horizon 2020 and other projects supported under Horizon Europe. The project “[Natural Intelligence for Robotic Monitoring of Habitat](#)” could provide hints about the usage of mobile robotic sensors.

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud shall be foreseen, exploiting synergies and complementarities of the different approaches.

Participatory approaches, such as citizen science, could be appropriate modes of research for this action.

In area B in particular, projects results funded under the following topics should be considered: HORIZON-CL6-2021-BIODIV-01-03: Understanding and valuing coastal and marine biodiversity and ecosystems services, Topic HORIZON-CL6-2021-BIODIV-01-04: Assess and predict integrated impacts of cumulative direct and indirect stressors on coastal and marine biodiversity, ecosystems and their services and HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems. In addition, in area B, projects should coordinate their activities with objective 1 of the Mission “Restore our ocean and waters”.

Proposals should include specific tasks and allocate sufficient resources to coordinate with existing platforms and information sharing mechanisms, in particular the EC Knowledge Centre for Biodiversity. Collaboration with the European partnership on biodiversity Biodiversa+ should be explored, as needed.

This topic should involve contributions from the social sciences and humanities disciplines.

The possible participation of the JRC in the project would ensure that the approach proposed is compatible with the IAS policy implementation and that data and information generated is shared through EASIN.

International cooperation is encouraged.

Biodiversity protection and restoration

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-BIODIV-01-2: Digital for nature

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 16.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, and one project highest ranked within the area B, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.</p>

<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Purchases of equipment, infrastructure or other assets specifically for the action (or developed as part of the action tasks) may be declared as full capitalised costs.
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Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030 projects’ results will contribute to the following impacts of the destination “biodiversity and ecosystem services”: “Plan, manage and expand **protected areas** and improve the conservation status of species and habitats based on up-to-date knowledge and solutions”; “to understand and address **drivers of biodiversity decline** and “mainstream **biodiversity, ecosystem services**, including through the development of **Nature-based Solutions**”.

The projects results are expected to contribute to all of the following expected outcomes:

- A better monitoring (in terms of the number of species and habitats, more exhaustive territory coverage, more frequent in time, more accurate and cost-effective) of biodiversity in the EU by high-throughput methods (for example environmental DNA, sound/image/spectral analysis, lidar, usage of mobile platforms, space technologies, etc.), leading to a better implementation of the nature directives.
- A better understanding of the state of nature and of the drivers of biodiversity loss (linked to direct human activity, to climate change, etc...) and of the state of conservation of nature through a better usage of existing data, and through the bridging of data gaps in order to support the implementation of the EU biodiversity strategy for 2030 and therefore to reverse biodiversity loss and to restore and protect ecosystems.
- A more complete view of the state of nature and its evolution which is needed to support policy implementation and policy making, including the Member States’ reporting obligations, supporting the definition and implementation of prevention and restoration measures and the monitoring of the achievement of their objectives, the extension of protected areas, the monitoring of invasive alien species, and the implementation of Nature based solutions and the assessment of their performance.

Scope: As quoted in a recent paper in Nature Communications, the growing amount of the collected environmental data is not optimally used: “there is a mismatch between the ever-growing volume of raw measures (videos, images, audio-recordings) acquired for ecological studies and our ability to process and analyse this multi-source data to derive conclusive ecological insights rapidly and at scale”¹⁰⁰. In the European Union, there is already a range of group of experts monitoring species and habitats, including in the view of reporting under the Birds and Habitats directives. However, the generated datasets are not sufficiently accessible (too many small, isolated communities of practice, different servers, different data access

¹⁰⁰ Tuia, D., Kellenberger, B., Beery, S. *et al.* Perspectives in machine learning for wildlife conservation. *Nat Commun* **13**, 792 (2022) <https://doi.org/10.1038/s41467-022-27980-y>.

methods, different formats, rarely accessible through web-services) and too often not well known or advertised outside of their original circle of experts: the access to the results (consolidated data, statistics, maps) of these field surveys should be significantly concentrated behind single entry points. Also, the access to modern technologies (*e.g.*, image recognition, sound analysis, high-throughput DNA-based techniques, usage of AI, usage of space, etc.) too often represents an important effort for each group of experts, beyond their environmental expertise. As a result, the technological developments remain an important effort for each group, while the solutions should better be provided as a service (to be configured to the need of each group) and mutualised. The natural domain being very large and sometimes difficult to access, the existing databases are still not dense enough, in terms of spatial and temporal coverage: many species and habitats are insufficiently covered (and sometimes not monitored at all), resulting in information gaps. Also, scarce samplings do not allow to distinguish non-presence from a lack of/insufficient/inadequate fields visit. A massive use of automated, and potentially mobile, sensor technologies (such as, but not limited to, images, video, sounds/ultra-sounds recording, spectral signatures, structure description by lidar, environmental DNA sampling, etc.) the use of remote sensing technologies (*e.g.* to over large areas, monitor environmental condition) and associated with processing algorithms (in particular, but not limited to, deep learning and AI processing algorithms) is therefore needed. The goal of this topic is to facilitate the access to data, encourage the usage of automated/robotic/space data collection systems for data collection, encourage community approaches for the exchange of data and good practices (in particular for data processing).

Proposals should address Area A or Area B as follows. The Area should be clearly indicated on the application.

- Area A: a project focussing on data harvesting through high-throughput methods (as described in the introduction, *e.g.* environmental DNA, sound/image analysis, lidar, spectrometry, usage of mobile platforms, remote-sensing, etc.), analysis and interoperability solutions, with the goal of concentrating the information in a single access point, and lowering the technical hurdle for the biologist and managers of natural sites, offering the best solutions in a ready-to-use form;
- Area B: a project focussing on new robotic solutions, including mobile, to improve the efficiency of biodiversity related solutions, allowing to improve the performance of the field campaign, with denser information of species and habitats.

Area A: data harvesting, analysis and interoperability solutions

The successful proposal is expected to address the needs in terms of IT solutions, to increase information density, in terms of species and habitats sampled, territory coverage, timeliness, and accuracy.

As a result, much denser data collections should be available through a common data portal. The successful proposal should demonstrate the feasibility to combine different sources of information, for example to assess the conservation status of habitats or species. In that respect, several approaches could be tested, from data combinations defined by expert rules,

and data storage formats, to machine learning or data-mining technologies. Such digital solutions could support the definition of conservation measures and management plans, and the monitoring and forecast (though model ingesting in-situ observations) of their progress to their objectives, at site, regional and national levels. Furthermore, the results could be used by member states for their formal monitoring and reporting obligations, or to check and enhance the performance of Nature Based Solutions.

The successful proposal should:

- Ensure interoperability of available data, enabling EU-scale information systems by developing solutions to connect and harvest data from already existing data bases. This will guarantee information fusion and support third party usage of the data.
- Develop cost-effective and easy-to use tools and software to collect and analyse different existing data sources and formats (in vivo data, photographs, sound recordings, lidar, spectrometry, eDNA, satellite images etc.), to facilitate cost-effective data analysis, map and link existing databases and provide algorithms to better analyse them.
- Develop data hosting and data processing solutions to extract information on populations (such as diversity, counts, trends), habitats (such as identification, area covered, and area change in time), assessment of conservation status and trend, information of species and habitats health conditions, degradations, and destructions (natural or human-driven). The accumulation of information should allow synoptic analysis of species and habitats, allowing to detect hot spot of issues and trends. Innovative solutions, such as data mining, remote-sensing and AI approaches need to be considered.
- Develop a solution to host, process, analyse and search available data in relation to protected habitats and species (including protected sites management information, their conservation objectives and measures, and restoration actions).
- Analyse and define infrastructure solutions, that would let biologists and managers of natural sites quickly create a dedicated working framework, furnished with all data harvesting, processing, sharing solutions. In this approach, the future European Green Deal data space should be considered as a potential common solution, or part of the solution.
- Develop tutorials for practitioners, based on academics and industry knowledge, on how to best use existing databases and data harvesting, data analysis and data sharing solutions. The tutorials should help the users to quickly set up and use their working environment.
- Propose easy-to-use solutions to utilise robotic sensors and Internet of Things (IoT): automated sensors, automated sampler, including mobile sensors (terrestrial, aerial and under-water) and animals tagging solutions, data sharing through wireless communication systems, to support a systematic data collection. Such approach should

help better mapping the known/unknown and significantly increase the density of collected data, spatially and temporally.

- Analyse the conditions under which data, raw data acquired from sampling, data coming from existing databases and data resulting from processing can be shared. A clear data sharing framework, accommodating special needs, simple to use in practice, supporting open data policies, and enabling the broadest usage whilst encouraging the largest community to contribute, should be defined. Special attention will be paid to endangered species and sensitive species (in the sense of the Birds and Habitats Directives) for which the shared data needs to be controlled, and methods for effective detection of invasive species by high throughput search would be encouraged.
- Enable EU Member States, Associated Countries, and accession countries to coherently set conservation objectives, preparing management plans, manage shared habitat types and species, deal with similar conflicts and socio-economic dimensions, permitting procedures, spatial planning, with a focus on implementing the Birds and Habitats Directives and their Natura 2000 network.
- Fully exploit and build complementarities with the ongoing work regarding the establishment of the European Open Science Cloud and interact with relevant projects developing metadata standards and added value tools to ensure interoperability within and across fields of study.
- Contribute to a web of FAIR data and supporting services that enable an interconnected disciplinary ecosystem that allows stakeholders to share digital objects and build on them in a seamless fashion.
- The architecture for a unified EU web-GIS with all the data collected from the Directives should be considered. In that matter, the proposed system should allow the member states sharing their habitats and species maps, and in particular the habitats maps used to designate their Natura 2000 sites, as well as subsequent updates. Also, the platform should help collecting information to update habitats and species maps, in order to obtain a common knowledge database about habitats and species, and their evolution, in relation to the Birds and Habitats Directives. The platform should as well foster the implementation of open data best practices at European level and across boundaries.
- Automatic translation functions should be offered by the platform to better connect EU Member States, Associated Countries and Accession Countries to support them in the implementation of the legislation on nature protection (such as the Birds and Habitats directives, the Invasive Alien Species regulation or the Marine Strategic Framework Directive).

Proposals should consider the possibilities offered by the future “Green data spaces” (CNECT). The DEP CSAs on the “preparatory actions for the European Green Deal Data Space” (exploring cloud-to-edge solutions, platforms and initiatives for data storage, exchange, and analysis as good practices for setting up the data spaces) are expected for Q4

2022-Q2 2024 and the “data spaces support centre” will start delivering on architectural blueprints in late 2023 and onward.

Proposals should earmark the necessary resources for cooperation and networking activities. Proposals should link to other relevant Horizon 2020 and Horizon Europe projects and initiatives, such as BiCIKL, EuropaBON, BioDT and connect to existing European Biodiversity data infrastructures including DiSSCo, eLTER and LifeWatch, where relevant. Proposals should also connect with relevant projects under Horizon Europe topics, such as HORIZON-CL6-2021-BIODIV-01-01: European participation in global biodiversity genomics endeavours aimed at identifying all biodiversity on Earth.”, HORIZON-CL6-2021-BIODIV-01-02: Data and technologies for the inventory, fast identification and monitoring of endangered wildlife and other species groups, HORIZON-CL6-2021-BIODIV-01-07: Ecosystems and their services for an evidence-based policy and decision-making and HORIZON-MISS-2021-OCEAN-02: Protect and restore marine and fresh water ecosystems and biodiversity. Projects using satellite data should link to HORIZON-CL6-2021-GOVERNANCE-01-14: User-oriented solutions building on environmental observation to monitor critical ecosystems and biodiversity loss and vulnerability in the European Union.

The possible participation of the JRC would help ensure that the methodologies proposed can support environmental compliance assurance, particularly by leveraging geospatial intelligence.

Collaboration with the European partnership on biodiversity “Biodiversa +” should be explored, as needed.

Area B: new robotic sensors for biodiversity

To increase the density of species and habitats observations across the EU territory, new robotic, and possible mobile, solutions need to be developed.

The proposed innovative solutions should:

- Be ready to use, easy to deploy and operate in natural environment.
- Consider automated solutions, and mobile platforms (land, air, water and under water) carrying sensors (such as, but not limited to, image, sound, lidar, spectrometry, eDNA, etc.) should be designed with fields campaigns in mind, in particular in terms of autonomy (energy, autonomy of moving and sampling decisions). Improvements in terms of species tagging, and species-carried tracking or telemetry devices should also be considered.
- The project should focus on innovative sensors that would allow significantly increasing knowledge in biodiversity, or bringing new information about the species and habitats conservation status, and increase spatial and temporal coverage, and to facilitate access to environments that are difficult to sample.

- Propose a large degree of data collecting automation and compatibility with the system described in project 1.
- The project should generate at least 1 innovative prototype of robotic/automated sensor and 1 innovative prototype of mobile solution, demonstrating improved performances compared to the currently available solutions.
- The project should analyse the conditions and costs of the production of the robotic system, as well as the conditions and costs of its usage and maintenance.

The project “[Natural Intelligence for Robotic Monitoring of Habitat](#)” could provide hints about the usage of mobile robotic sensors.

International cooperation is encouraged.

Mainstreaming biodiversity in society and the economy

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-BIODIV-01-3: Dependence of society and the economy on pollinators

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 13.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the European Green Deal and in particular with the objectives of the EU biodiversity strategy for 2030 and the EU pollinators’ initiative, projects will contribute to mainstream **biodiversity in society and the economy**.

Project results are expected to contribute to all following expected outcomes:

- Direct and indirect dependences of our society and the economy on pollinators are better understood and quantified;

- Monetary and non-monetary valuation of ecosystem services provided by pollinators are advanced, and used to improve ecosystem accounting;
- Tools for mainstreaming pollinator conservation into the food, health, energy, materials and land management sectors are developed, tested and promoted with public authorities, businesses and the general public;
- Risks of reversible and irreversible cascading effects in natural and modified ecosystems due to pollinator decline, and their impacts on human wellbeing, are better understood and forecasted, and integrated into models for participatory scenario planning.

Scope: The importance of pollinators for humankind is common knowledge, featuring prominently outside of the scientific realm in popular culture and arts. Yet, even well-known benefits provided by pollinators such as crop pollination are still inadequately understood. Other benefits remain for the most part obscure, and thus unacknowledged, due to the lack of research targeting the complexity of pollinator niches and plant-pollinator networks. Amid the dramatic decline of pollinating species in Europe, these gaps hinder understanding of the character and full magnitude of threats to human wellbeing. Moreover, the gaps hinder mainstreaming of the conservation of pollinators, and more broadly biodiversity, in the public and private sector and thereby impede an effective societal response. This topic aims to address fundamental knowledge gaps in functional roles of pollinators in natural (natural plant-pollinators networks) and human-modified ecosystems (e.g. agro-ecosystem), and building on that i) advance research on far reaching consequences of their decline and scenario planning and ii) develop and disseminate tools that enable systematic mainstreaming in key sectors.

The proposed projects should build on the Assessment Report on Pollinators, Pollination and Food Production of IPBES¹⁰¹, the first ever EU-wide Ecosystem Assessment 2020¹⁰², the INCA project¹⁰³, the European Red List assessments¹⁰⁴, and knowledge and experience gained through past projects supported under the EU Framework Programme for Research and Innovation¹⁰⁵. Furthermore, the projects should liaise with relevant ongoing projects under Horizon Europe¹⁰⁶ and EU funded monitoring initiatives¹⁰⁷.

The proposals should show how their results would contribute to the EU policies, as well as to the global sustainable development agenda (UN Sustainable development Goals).

Proposals should include specific tasks and envisage sufficient resources to develop joint deliverables (e.g., activities, workshops, as well as joint communication and dissemination) with all projects funded under this topic and to facilitate cooperation with the European

¹⁰¹ <https://ipbes.net/assessment-reports/pollinators>

¹⁰² <https://publications.jrc.ec.europa.eu/repository/handle/JRC120383>

¹⁰³ <https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/de44610d-79e5-010a-5675-14fc4d8527d9?t=1624528835061>

¹⁰⁴ <https://ec.europa.eu/environment/nature/conservation/species/redlist/>

¹⁰⁵ <https://wikis.ec.europa.eu/display/EUPKH/Research+and+innovation>

¹⁰⁶ <https://wikis.ec.europa.eu/display/EUPKH/Horizon+Europe>

¹⁰⁷ <https://wikis.ec.europa.eu/display/EUPKH/Monitoring+initiatives>

biodiversity partnership Biodiversa+¹⁰⁸ and other platforms such as the EC Knowledge Centre for Biodiversity¹⁰⁹.

For the implementation of the eligibility condition on the 'multi-actor approach', proposals should ensure adequate involvement of researchers, farmers and other land managers, businesses involved in the food, medicine, energy and/or materials sectors, decision-makers at local and/or regional level, civil society organisations and other relevant actors.

Successful proposals should:

- Investigate essential functional roles of pollinators in natural and human-modified ecosystems, and associated ecosystem services. This should encompass ecosystem services underpinned by pollinators both directly and indirectly;
- Fill knowledge gaps on animal pollination ecology (what pollinates what, how much, where and when) and investigate the full spectrum of animals that pollinate wild and cultivated plants in Europe, going beyond the well-known insects (bees, hoverflies, butterflies, moths). The structure and functionality of plant-pollinator networks should be analysed. The research scope should include the European continent as well as EU overseas territories;
- Build a platform that will serve one-stop shop for information on animal pollination ecology. A database with systematised information on plant-pollinator interactions, including the spatial dimension of plant-pollinator networks, should be part of the platform. The platform should build on what already exists and should be devised in close collaboration with researchers and other potential users. Options to integrate this deliverable into the already existing platforms should be explored, with a view to ensure its long-term viability;
- Assess the dependency of society and the economy on ecosystem services underpinned directly and indirectly by pollinators, quantify and map the risks associated with pollinator decline. Monetary and non-monetary valuation of those ecosystem services should be advanced, including their tangible and less tangible elements, and utilised to improve ecosystem accounts and scale up their use in the public and private sector;
- Investigate biomass supply chains dependent on pollinators, build tools for businesses to assess their vulnerability to pollinator decline and improve guidelines on how they can help to reverse the decline and thereby mitigate future risks. This should in particular cover the food (including production of plants with mandatory cross-pollination), medicine, energy and materials sectors;
- Build tools for land managers and planners to support spatial decision-making with regard to the conservation of pollinators and protection of the local flow of ecosystem services that they deliver, e.g., digital atlases, maps, applications. In particular, tools for

¹⁰⁸ <https://www.biodiversa.org>

¹⁰⁹ https://knowledge4policy.ec.europa.eu/biodiversity_en

farmers should be developed, enabling assessment of impacts on their income and overall business performance of farms, early warning of pollination-deficit as well as social impacts on farming communities;

- Investigate the dependency of sustainable nutrition on pollinators and potential risks due to their decline. Particular attention should be paid to food with invaluable and irreplaceable properties for human health (e.g. with regard to micronutrients);
- Investigate risks of cascading effects in natural (natural plant-pollinators networks) and human-modified ecosystems due to pollinator decline and their impacts on human wellbeing, and undertake scenario forecasting towards 2050 in the case of an unmitigated pollinator decline. Uncertainty and irreversibility of the effects should be well integrated in the build-up of models.

HORIZON-CL6-2024-BIODIV-01-4: Biodiversity, economics and finance: Understanding macro-financial risks associated with biodiversity loss

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: In line with the European Green Deal priorities and in particular with the EU biodiversity strategy for 2030 and the EU strategy for financing the transition to a sustainable economy, the successful proposal(s) will help unlock financial flows needed for reversing biodiversity loss, and contribute to mainstreaming biodiversity, ecosystem services and natural capital in the society and economy.

Project results are expected to contribute to all of the following expected outcomes:

- New knowledge to accelerate the ecological transition and socioeconomic transformation towards nature-positive economy across EU, in a context of erosion of natural capital and degradation of ecosystems and their essential services;
- Enhanced understanding and quantification of the macroeconomic significance of biodiversity and implications of its loss at EU level as a basis for more coordinated and better organised responses by key economic actors and institutions, including key policy making processes (e.g., EU semester);

- Information, tools and metrics to better integrate biodiversity and its loss into mainstream macro-financial analytical frameworks, risk assessment and management methods as a basis for enhancing natural capital and NBS;
- Development of more comprehensive and more robust environmental risk management in the financial sector;
- Mobilisation of mainstream finance to slow down, and reverse biodiversity loss in the broader context of environmentally sustainable development by catalysing nature-positive investments contributing to the objectives of the European Green Deal;
- Evidence base to support the implementation of the EU strategy for financing the transition to a sustainable economy.

Scope: The erosion of natural capital combined with the collapse of ecosystems entails potentially far-reaching economic and financial implications, including risks for macroeconomic and financial stability of key institutions, countries and regions. The decline of ecosystem services poses physical risks for economic and financial actors that depend upon those services, while socioeconomic transformations could trigger transition risks. As more than half of the world's GDP relies on nature¹¹⁰, it is estimated that the risks triggered by ecosystem degradation to human societies could be at least as high as those imposed by climate change. Furthermore, these risks are growing as biodiversity is declining at unprecedented rates in human history, which calls for improved understanding, assessment and risk management approaches by key economic actors such as corporates, governments, central banks and financial supervisors. However, a wide range of challenges, including the complexity of ecosystem processes, uncertainty about tipping points and valuation problems, make it very difficult.

Actions should improve the state-of-art knowledge on the relationships between biodiversity, economy and the financial system including better understanding of the nature and degree of risks associated to biodiversity loss, how these risks interact with each other and are likely to evolve over time.

In particular, actions are expected to:

- Expand the evidence base on the dependence of the EU economy and its financial sector on nature, including by producing relevant macroeconomic indicators, e.g., assessing the share of the EU GDP and employment that depends on nature and evaluate implications of biodiversity loss. As much as possible, research should also extend to country level analysis and/or prepare the ground for future more in-depth studies with increased geographical resolution.

¹¹⁰ Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy | World Economic Forum ([weforum.org](https://www.weforum.org)).

- Develop scenarios tailored to financial risk assessment, including identification of assets under highest risk from being stranded and sectors that represent the highest risk exposure.
- Co-design principles for a more comprehensive and more robust environmental risk management in the financial sector, develop innovative methodologies and tools to support risk assessment that can better capture the specificities of nature and ecosystems.
- Explore tools to assess the alignment of corporates and financial institutions with major European and global biodiversity-related goals, including by leveraging of the EU Taxonomy on Sustainable Finance.
- Investigate how biodiversity loss interacts with climate change and other socio-environmental challenges in regard of macro-financial stability and how different risks can reinforce each other.
- Identify possible response options and issue recommendations for EU institutions and Member States, investors, companies and other financial market participants about macro-financial risks of biodiversity loss.

In their research, actions should investigate various possible risk categories including both physical and transition ones, their transmission channels and cascading effects through sectors and supply chains, as well as adaptive capacity of economic and financial agents/institutions, with particular focus on the EU, its Member States and Horizon Europe Associated Countries. The analysis should extend to worst-case scenarios and include low-probability but high-impact biodiversity-related tail risks.

Actions should build on and/or establish synergies with the relevant work by initiatives/projects/studies including, but not limited to, the World Economic Forum's New Nature Economy Report Series¹¹¹, Network for Greening the Financial System¹¹², Taskforce on Nature-related Financial Disclosures¹¹³, The Finance for Biodiversity (F4B) initiative Accounting for ecosystems and their services in the European Union (INCA)¹¹⁴ and EU Member States (MAIA)¹¹⁵ projects, Indebted to Nature report¹¹⁶ and the working paper 'A "Silent Spring" for the Financial System? Exploring Biodiversity-Related Financial Risks in France'¹¹⁷.

Actions are expected to involve and co-create with the end-users (financial institutions, non-financial corporations, governments etc.) to fully account for their respective views and needs. Actions should bring together from the start multiple types of scientific expertise in social

¹¹¹ <https://www.weforum.org/reports/new-nature-economy-report-series>

¹¹² <https://www.ngfs.net/en>

¹¹³ <https://tnfd.global/>

¹¹⁴ <https://ec.europa.eu/eurostat/documents/7870049/12943935/KS-FT-20-002-EN-N.pdf/de44610d-79e5-010a-5675-14fc4d8527d9?t=1624528835061>

¹¹⁵ <https://maiaportal.eu/about>

¹¹⁶ <https://www.dnb.nl/en/general-news/2020/indebted-to-nature/>

¹¹⁷ <https://publications.banque-france.fr/en/silent-spring-financial-system-exploring-biodiversity-related-financial-risks-france>

sciences and humanities, in particular in economics and finance, as well as scientific expertise in biodiversity and natural capital.

Actions should envisage clustering activities with projects funded under this topic as well as with other relevant Horizon Europe and Horizon 2020 projects working on links between biodiversity and sustainable finance and economics of biodiversity¹¹⁸. To this end proposals should foresee dedicated tasks and appropriate resources for coordination measures, joint activities, and joint deliverables.

HORIZON-CL6-2024-BIODIV-01-5: Transformative action of policy mixes, governance and digitalisation addressing biodiversity loss

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: In line with the European Green Deal priorities, in particular with the EU biodiversity strategy for 2030 and the 2030 climate pact, successful proposals will develop knowledge and tools to understand the role of transformative change for biodiversity policy making, address the indirect drivers of biodiversity loss, and initiate, accelerate and upscale biodiversity-relevant transformative changes in our society. They will also help understanding the impacts of and the opportunities offered by digital transformation, new emerging technologies, and social innovation on biodiversity. Successful proposals will contribute to the following expected impact: mainstream biodiversity, ecosystem services and natural capital in the society and economy: integrate them into public and business decision-making; build approaches for enabling transformative changes to face societal challenges including through the deployment of Nature-Based Solutions (NBS).

Projects should address all of the following outcomes:

- Foresight on society well-being based on realistic assumptions on careful use of natural capital and analysis of the consequences in terms of economic growth.
- Evaluation of feasibility and limits of decoupling economic activities from natural capital use.

¹¹⁸ Notably Horizon Europe projects Invest4Nature and projects resulting from the calls: “H HORIZON-CL6-2023-BIODIV-01-10: Build up of knowledge on Nature Positive Economy and supporting its scale-up”.

- Knowledge and understanding of the transformative changes needed to address the indirect drivers of biodiversity loss underpinned by societal values and behaviours, better design of policy mixes and governance.
- Operational knowledge available to, and used by policymakers, on indirect drivers of biodiversity loss that are underpinned by societal values and behaviours, and on the transformative changes that are necessary to tackle these indirect drivers.
- Improved and new systemic, sustainable policy mixes and governance approaches developed to enable biodiversity-relevant transformative change, based on a range of policy tools, economic research, instruments or regulations.
- Methods and tools promoting win-win solutions for biodiversity and socio-economic objectives, the use and mainstreaming of ‘green over grey’ approaches and the application of the ‘do no harm’ principle are available and taken up across the policy spectrum, planning and investment decisions, business and finance, and civil society.
- Approaches to facilitate the application of such methods and tools are identified and used, while factoring in societal and political processes (such as citizen engagement, political campaigns, science denialism). Solutions can include stocktaking of good practice, standards, agreements, charters, commitments, regulations, engaging society and incorporating lifelong learning.
- A better understanding of the impacts on, risks and opportunities for biodiversity of digital transformation (for example data-driven technologies, artificial intelligence, robotics, automation, miniaturised sensors, citizen science applications, crowd sourcing), new materials (e.g., for biomimicry), the energy sector (e.g., through energy/electricity infrastructure), and new and emerging technologies.
- Identification and assessment of how system-level change affecting biodiversity through social innovation happens.
- Testing active intervention by R&I policy and sector policies (niche creation, reformulation of governance), also by empowering and endowing communities.

Scope: In line with the EU biodiversity strategy for 2030, successful proposals will develop:

- operational knowledge and understanding of transformative change needed to address the indirect drivers of biodiversity loss underpinned by societal values and behaviours, which is available to, and used by policy makers.
- improved and innovative governance tools and policy mixes that can effectively initiate, accelerate and upscale such biodiversity-relevant transformative changes in our society.
- help understanding the impacts of and the opportunities offered by digital transformation, use of data and sensors, emerging technologies such as AI and robotics and social innovation on biodiversity.

- Proposals should look at key indirect drivers of biodiversity loss (including production and consumption patterns, human population dynamics and trends, trade, technological innovations and local through global governance), the kind of transformative changes necessary to tackle these societal drivers, effective governance approaches, tools and policy mixes to enable these changes, and how to further mainstream biodiversity into policy making, science, and governance within and beyond socio-economic, climate and environmental agendas.
- Proposals should generate knowledge on how to tackle biodiversity loss linked to technological and social innovation, which includes digitalisation. Proposals should explain how changes by technological/social innovation are impacting biodiversity – for example by bringing in new and emerging technologies, new production processes, consumer products, regulations, incentives, or participatory processes.
- Proposals should produce case studies on what transformative change means in practice and a collection of good and failed examples of developing and implementing policy tools, best practices and instruments, and on impacts of digitalisation, which could feed into the just transition process and inform and inspire transformative change through learning, co-creation and dialogue.
- Proposals should develop methodologies to assess the impacts of their proposed solutions on policy and its decision making. This includes impacts from energy/electricity infrastructure related to digitalisation, on democracy and on trust in science on environmental, social and economic systems. Such assessments should focus on the direct and indirect effects of digital developments on biodiversity, intertwined with climate change and health.
- This topic should involve contributions from the social sciences and humanities disciplines, as well as social innovation.
- The proposals should build their analysis upon the synergies of multiple Sustainable Development Goals, to deliver direct and indirect biodiversity benefits, and of the role of biodiversity in reaching the set of Sustainable Development Goals, considering the importance of policy mixes, governance and digitalisation.
- Proposals should include specific tasks and allocate sufficient resources to develop joint deliverables (e.g., activities, workshops, joint communication and dissemination) with all projects from the same topic and the portfolio of all projects on transformative change related to biodiversity funded under this destination since 2021.
- Proposals should use or interoperate with existing platforms and information sharing mechanisms relevant for transformational change and on biodiversity knowledge.
- Projects are expected to cooperate with the European partnership on biodiversity, Biodiversa+, and the Science Service project Bio-agora. Proposals should show how their results and outcomes could provide timely information for major science-policy

bodies such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC), and the Convention on Biological Diversity.

- Where relevant, projects are expected to create links to and use information, data and impact-related knowledge from the European Earth observation programme Copernicus, the ESA EO4SD initiative, the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS).

Biodiversity friendly practices in agriculture, forestry and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-BIODIV-01-6: Promoting pollinator friendly farming systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the EU biodiversity strategy for 2030, the farm to fork strategy, the EU climate policy under the European Green Deal, successful proposals will promote a pollinator friendly agriculture, contribute to the transition to more sustainable practices in agriculture, and support biodiversity in agroecosystems.

The project results are expected to contribute to all of the following expected outcomes:

- Farming systems are more pollinator-friendly and support (agro)biodiversity;
- Pollinator-friendly varieties, rotations and combination of crops are promoted;
- Farmers are more aware of the importance of pollinator-specific planning and measures available to enhance pollination services;
- Breeding sector is adapted to develop varieties adapted to pollinator-friendly farming.

Scope: The production of many crops depends on pollinators. Different types of measures are needed to tackle the causes of pollinator decline, enhance crop pollination, and promote pollinators in agriculture. Many crops have specific traits, which have been identified to enhance crop–pollinator interactions. The development of crop varieties with specific traits to attract and reward pollinators is an appealing strategy to address needs of agriculture and pollinators. This could also improve crop yields, nutritional resources for pollinators and promote a pollinator-friendly agriculture.

Pollination activities are also impacted by variety (genotype), environment, and management practices (GxExM). Pollinator-specific planning needs to consider temporal and spatial crop management and other strategies of management (e.g., field margin composition and structure) to enhance pollination services.

Proposals should:

- Increase the understanding of the crop-farming system-pollinator relationship in combination with the interaction between crop, environment and management (GxExM);
- Identify crop traits that enhance crop-pollinator interactions, engage in breeding activities and contribute to the development of pollinator-friendly varieties;
- Identify, test and demonstrate farming systems that take into consideration temporal and spatial diversification of crops as well as landscape features to match pollinators needs;
- Promote and facilitate the uptake of farm-pollinator friendly practices;
- Support capacity building, training and education enabling farmers/growers to adopt sustainable agricultural practices;
- Develop strategies to create value of pollinator friendly approaches along the value chain.

Proposals should build on the results of relevant projects funded under Horizon 2020 and ensure collaboration with projects funded under the following call in Horizon Europe work programme 2021-2022: *HORIZON-CL6-2022-BIODIV-02-01-two-stage: Maintaining and restoring pollinators and pollination services in European agricultural landscapes.*

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of researchers, the breeding sector, farmers, agricultural advisors and other relevant actors. The topic is open to all types of farming systems (e.g., arable farming, horticulture, fruit trees) in various geographical and pedo-climatic conditions. Result of activities should benefit both conventional and organic farming.

HORIZON-CL6-2024-BIODIV-01-7: Reintroduction of landscape features in intensive agricultural areas

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In supporting the implementation of the European Green Deal, the EU biodiversity strategy for 2030, the farm to fork strategy and the common agricultural policy, successful proposals will contribute to develop and improve practices in agriculture to support and make sustainable use of biodiversity and a wide range of ecosystems services.

Projects results are expected to contribute to all of the following expected outcomes:

- Drivers and challenges for the re-introduction of landscape features in intensive farming areas are better identified.
- Strategies to reintroduce landscape features in intensive agricultural areas for national and regional policy- and decision-makers are built, contributing to the following key-commitments of the EU biodiversity strategy 2030: “At least 10% of agricultural area is under high-diversity landscape features”; and “Three billion new trees are planted in the EU, in full respect of ecological principles”.
- Solutions for climate change adaptation and to provide ecosystem services, in particular carbon sequestration, are developed for areas of intensive agriculture.
- The ground for possible future demonstration projects is prepared.

Scope: According to the EU biodiversity strategy for 2030, “to provide space for wild animals, plants, pollinators and natural pest regulators, 10% of agricultural area should be brought back under high-diversity landscape features, including, inter alia, buffer strips, rotational or non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds”. These should help enhance carbon sequestration, prevent soil erosion and depletion, filter air and water, and support climate adaptation. In addition, more biodiversity often leads to more agricultural production over the medium and long term.

In the EU there are large agricultural intensive areas where nature has almost disappeared. There is a need to reintroduce nature to improve the state of the environment by delivering ecosystem services and as a contribution to climate mitigation and adaptation. In particular it is needed to achieve ecological corridors, in conjunction with other multifunctional Nature-

based Solutions. Landscape features may also be included as remedial measures to protect soil; their biogeochemical functions may counteract the spread of chemical pollutants from agriculture to groundwater and open waters, especially those derived from natural and mineral fertilizers.

The new common agricultural policy (CAP) may offer specific tools to support farmers who dedicate space for biodiversity rich landscape features, such as dedicated eco-schemes or area related interventions (such as agri-environmental interventions) or non-productive investment interventions (one-off costs arising from establishing landscape features such as hedges, ponds, wetlands or stone walls). The agri-environment interventions under CAP Strategic Plans will continue to be implemented on a voluntary basis. They have been used in a quite limited extent until now to promote the reintroduction of biodiversity-rich landscape features in areas of intensive agriculture. Eco-schemes are new tools to support farmers in the first pillar of the CAP (direct payments) in the form of incentives to farmers to adopt more environment-friendly practices. They may cover the reintroduction of biodiversity rich landscape features, but this will depend on a number of factors, notably the implementation choices of Member States in their CAP Strategic Plans and the level of support.

This topic intends to look into key-factors which may lead to the reintroduction of landscape features in areas of intensive agriculture beyond financial incentives.

Proposals should:

- assess the increase of the environmental and economic value and the potential for land productivity linked to the increase of biodiversity rich landscape elements on agricultural land with intensive organization of production. They should address the valuation (monetary and social benefits) of the ecosystem services of landscape features, based on existing R&I projects, and assess the perception of land managers/owners of this value increase. Proposals could notably build on available knowledge on Natural Capital Accounting¹¹⁹.
- investigate into possible business models which can combine the reintroduction of landscape features with rewarding economic activities including possibly recreational ones. This could build on positive experiences with productive trees part of arable land agroforestry systems. Projects should address the need to build green corridors and consider where and why reintroducing landscape features makes sense for this. The need to restore water systems through the restoration of streams and small rivers should be included.
- assess the decision-making process of land owners/managers which can lead to the reintroduction of landscape features in areas of intensive agriculture and analyse enabling mechanisms. This assessment should go beyond analysing available financial incentives and should include in particular factors such as social, generational and gender aspects, awareness about the intrinsic value of biodiversity and the importance of

¹¹⁹ [Natural Capital Accounting - Environment - European Commission \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1)

agricultural land for maintaining biodiversity in the natural landscape matrix in the context of climate change and persistent landscape fragmentation, the type of land exploitation (land in private ownership or lent, legal form of holdings...), etc,

- identify possible pathways towards more diversified business models involving nature and what could be the right incentive(s) (beyond financial incentives) to lead to change.
- formulate strategies to reintroduce landscape features in areas of intensive agriculture.

The topic is open to all types of farming systems (e.g., arable farming, horticulture, fruit trees) in various geographical and pedo-climatic and conditions.

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Proposals should build on the results of relevant EU-funded research projects. They should use existing platforms and information sharing mechanisms notably the EC Knowledge Centre for Biodiversity.

The JRC may provide expertise on landscape features identification, typology, quantification in the frame of EU policy.

HORIZON-CL6-2024-BIODIV-01-8: Conservation and protection of carbon-rich and biodiversity-rich forest ecosystems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>

Expected Outcome: In line with the EU biodiversity and climate objectives, successful proposals will support the protection of biodiversity-rich forest ecosystems, at the species’

distribution rear edges and margins that are at high risk of collapse in light of a rapidly changing climate.

Project results are expected to contribute to all of the following outcomes:

- Improved knowledge on the cross-impacts between biodiversity and climate change: drivers of biodiversity loss and the interrelation with forest-based adaptation and mitigation needs; impacts of climate change on forest biodiversity and forest species migration; and links between forest species diversity and forest resilience to climate change.
- Identification of win-win management practices (including non-intervention, climate-smart forestry) and development and implementation of ecosystem protection and restoration methods and tools for resilient, carbon rich and biodiversity supportive forests.
- Better understanding of the drivers and barriers for natural co-migration of forest communities and development of approaches and guidelines to foster co-migration.
- Improved tools and indices for the joint monitoring of biodiversity and climate aspects on forests.
- Empirical analysis of the current forest management and conservation practices in European forests of high ecological value, including governance (regulations and their impact), management responses to climate change and an assessment of drivers that determine management on the ground.
- Strict protection of primary and old-growth forest in Europe by 2030.

Scope: Biodiversity-rich forest ecosystems, in particular at the species' distribution edges, are at a high risk in light of a rapidly changing climate. When not being in their optimal climate conditions, they are more fragile to biotic and abiotic damages and do not provide ecosystem services in an optimal manner.

While for tree species assisted migration and assisted gene flow is considered as a possibly solution in actively managed forests, the dependent forest communities (e.g., plants, fungi, insects, soil microorganisms etc.) might fail to follow the speed of habitat shifts what in turn may result in a loss of biodiversity. In addition, migration failure of mutualistic species (fungi, mycorrhiza) can jeopardize the success of tree migration.

Protected areas without the option for assisted migration, will particularly depend on the larger landscape context for community migration and adaptation, as many of them have not been designed to account for the long-term and large-scale dynamics.

Proposals will:

- Set up case studies in European forests or tropical forests; particularly targeting forests of high ecological value, such as primary and old-growth forests, Mediterranean forests, peat swamp forests or mangroves.
- Improve existing or develop new predictive models of biodiversity changes, advance the understanding of species connection with the forest habitat, and analyse to what extent species can survive in a changed and fragmented habitat with a view to establishing protected forest networks.
- Analyse directions of assisted tree migration to maximize dynamic gene conservation (as form of ex situ conservation)
- Assess the risk for biodiversity loss in protected areas and develop protection strategies that consider the larger landscape and regional context to allow for natural species and community migration.
- Develop approaches and guidelines for forest managers and conservationists in a context of forest ecosystem migration and map scenarios of potential forest ecosystem migration routes.
- Connect with relevant institutions at regional, national and EU-level as well as relevant stakeholders to regularly disseminate the research results.
- Improve monitoring techniques, including remote-sensing and field-data methods integrating technologies such as AI, IoT, robotics or blockchain, to better assess biodiversity and climate aspects of forests.

Due to the scope of this topic, international cooperation is strongly encouraged.

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain.

JRC will contribute with dataset on forest tree species distribution and support the development of satellite monitoring of forest metrics.

HORIZON-CL6-2024-BIODIV-01-9: Selective breeding programme for organic aquaculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Research and Innovation Actions

<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.
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Expected Outcome: In line with the European Green Deal priorities and in particular with the EU biodiversity strategy for 2030 and the 2030 climate target pact, a selective breeding programme for organic aquaculture will be developed contributing to the impact “develop and improve practices in agriculture, forestry, fisheries and aquaculture to support and make sustainable use of biodiversity and a wide range of ecosystems services”.

The selected project is expected to contribute to all of the following outcomes:

- Contribution to a non-toxic environment, to a high level of biodiversity (including genetic diversity) and to high animal welfare standards meeting the species-specific behavioural needs;
- Significantly boost in the quality of aquaculture products, improving traits of economic and welfare importance;
- Increased feed efficiency that will also result in a reduced environmental impact through the minimization of feed residues in the natural environment;
- Less disease outbreaks through genetic progression, i.e. greater disease resistance, increased feed efficiency, faster growth and improved traits of economic and welfare importance;
- Increased knowledge and acceptance of organic aquaculture and its products in the general public through true stakeholder and consumer involvement.

Scope: Regulation (EU) 2018/848 lays down detailed production rules for organic aquaculture and requires the use of organic juveniles for on-growing purposes. Breeding under organic conditions is essential to achieve the objectives of organic aquaculture and respect its principles. Breeding is at the same time essential to allow the farmers to reach good productive results and efficient use of the resources under organic production conditions.

Proposals should plan breeding programs under organic aquaculture for the main European aquaculture finfish species, i.e. seabass, seabream, trout and salmon. They should breed organic juveniles under organic production conditions respecting high animal welfare standards (as set in regulation 2018/848 and Implementing Regulation 2020/464) and should aim to improve species resilience, diseases resistances and feed efficiency satisfying nutritional needs using as much as possible alternative feed materials to increase production sustainability.

Proposals should work on different species and/or different climatic areas tailored to the specificity of the organic aquaculture production and carefully analyse each solution not only in terms of performance but also in terms of the welfare of the farmed animals. They should work on preserving genetic diversity and adaptive potential by developing selective breeding programmes considering interactions between genotypes and rearing systems.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Call - Biodiversity and ecosystem services

HORIZON-CL6-2024-BIODIV-02

Conditions for the Call

Indicative budget(s)¹²⁰

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ¹²¹	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-BIODIV-02-1-two-stage	IA	16.00	Around 8.00	2
HORIZON-CL6-2024-BIODIV-02-2-two-stage	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-BIODIV-02-3-two-stage	RIA	10.00	Around 5.00	2
Overall indicative budget		36.00		

General conditions relating to this call

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

¹²⁰ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

¹²¹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Mainstreaming biodiversity in society and the economy

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-BIODIV-02-1-two-stage: Demonstrating Nature-based Solutions for the sustainable management of water resources in a changing climate, with special attention to reducing the impacts of extreme droughts

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 16.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: In addition to the standard eligibility conditions, proposals must include demonstration activities to be carried out in at least four different Member States or Associated Countries. At least one of the proposed

	demonstrations must take place in a region eligible for Cohesion funds.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: In line with the European Green Deal priorities, notably the EU biodiversity strategy for 2030, as well as the EU climate adaptation strategy and the EU's climate mitigation ambition for 2030 and 2050, the successful proposals will support the development of Nature-based Solutions (NBS) contributing to the sustainable management of water resources in a changing climate, with a special attention to reducing the impacts of extreme droughts.

Project results are expected to contribute to all of following expected outcomes:

- Cost-effective ways of implementing NBS at large scale for integrated water management are ready to use for relevant stakeholders and widely replicated;
- Consolidated evidence of the contribution of NBS to sustainable water management and of NBS' cost and resource efficiency, notably concerning the reduction of impacts of droughts;
- Enhanced implementation of EU policies, notably for water management (Water Framework Directive, as well as the Floods Directive, when relevant), climate adaptation (Article 5 of the European Climate Law, EU strategy for climate change adaptation), the EU biodiversity strategy for 2030 and the EU soil strategy for 2030.

Scope: Due to the changing climate, many European regions are already facing more frequent, severe, and longer lasting droughts. Extreme droughts can have cascading effects; e.g., they reduce water levels in rivers and ground water, stunt tree and crop growth, increase pest attacks, favour the occurrence of sand drifts and storms and fuel wildfires. Moreover, impacts of extreme droughts accumulate over time across large areas, and the effect can linger for years. In areas with an intense demand for water supply, the impacts of droughts add up to the stress imposed to water systems by human activities.

In Europe, most of the losses caused by extreme drought (~EUR 9 billion/year) affect agriculture, forestry the energy sector and the public water supply. Extreme droughts in western and central Europe in 2018, 2019 and 2020 caused considerable damage. With global climate change deepening, the impacts will be even more severe in the future, including decreasing quality, occurrence and availability of standing and running water.

By deploying systemic thinking NBS utilise an understanding of the structure and functioning of local ecosystems over time to address a broad range of societal challenges, including having enough water of good quality, both in surface waters and in ground water. They also contribute to restoration of biodiversity and help carbon sequestration in the soil. As such,

NBS are highly adaptable to respond to changing local conditions and are often more cost and resource efficient than purely technological approaches in the longer term.

The 2021 EU climate adaptation strategy underlines that NBS represent multipurpose, “no regret” solutions, with environmental, social and economic benefits and help build climate resilience. They can have an essential role in land-use management and infrastructure planning to reduce costs, provide climate-resilient services, and improve compliance with Water Framework Directive (WFD) requirements.

However, evidence on the cost-efficiency of these measures remains dispersed and incomplete, and do not address the whole catchment area in a holistic approach. River basin management plans are still limited in the recognition of NBS capacity to contribute to drought resilience. Furthermore, we are still missing more and longer-term evidence of the combined effects of different designs and combinations of NBS operating in different contexts (urban, peri-urban and rural) and/or at different scales and/or different climatic zones, in what regards the sustainable management of water resources to reduce the impacts of extreme droughts. At the same time, the co-benefit that these NBS may bring to reduce hydrogeological risks such as flood peaking and stabilising hydrographs for both droughts and floods is still to be demonstrated.

The successful proposals should:

- Demonstrate innovative, systemic and locally attuned NBS (as single interventions or as a combination of them), for the management of catchment water resources and the reduction of extreme drought risks, in areas that are heavily impacted by temporary or lasting water scarcity and areas that are being increasingly exposed to this risk with the deepening of climate change.
- Be incorporated into an integrated design concept for land and water management at the appropriate scales (preferably at landscape level, integrating water, soil and ecosystems as a whole), in accordance with WFD objectives, considering longitudinal connectivity of water flows, lateral connectivity with floodplains and adjacent grounds, and connections between surface- and groundwater.
- Plan, co-design and co-deploy solutions in a transdisciplinary multi-stakeholder and participatory context with due consideration and integration of social and cultural aspects and climate change effects.
- Building on the work of Horizon 2020 projects and their taskforces, develop an advanced monitoring programme for the demonstrated solutions and test and further develop as needed the EU Impact Evaluation Framework for NBS to assess the economic, social and ecological benefits of NBS and provide quantitative evidence, including positive and negative synergies, and analysis of trade-offs, for higher performance.

- Identify and assess barriers related to: functional conflicts in land-use; NBS technical, commercial, social and cultural acceptance (e.g., farmers perceptions and values, the role of private landowners); and policy regulatory frameworks (e.g., the role of the common agriculture policy, urban, rural and regional development plans) - and propose ways to overcome them (for example through new business cases and governance approaches).
- Develop methodologies and tools, adapted to end-users (e.g., farmers, forest owners, local authorities, engineers, spatial planners), enabling the replication and up-scaling of NBS.
- To provide a long-term evidence as ambitious as possible, new interventions should be complemented with the analysis of established NBS. In this respect, opportunities to build up from relevant initiatives should be explored (e.g., LIFE, INTERREG, national funded projects, etc).
- Develop protocols and standards for the design, operation and maintenance of NBS, building on existing work, considering:
 - The best solutions for different soil characteristics (as these determine the type and impact of droughts) and soil health, relief and geo-morphological conditions, including urban conditions;
 - The resilience of NBS, considering present and future climatic conditions and water regimes;
 - The ecological performance and resilience of NBS, to deal with both natural and human-induced hazards, such as extreme weather events, desertification, forest fires, plant- and animal diseases (pests), other human activities and socio-political approaches that could have an impact on land-use;
 - The long-term maintenance of NBS: also in relation to the adequate management of biomass, synergies with other approaches that affect the management of ecosystems like agroforestry, etc.

Proposals should address all of the above points.

Because of the substantial investments that might be necessary for implementing the NBS, additional or follow-up funding (private or public) should be sought, considering the EU taxonomy, including from relevant regional/national schemes under the Recovery and Resilience Fund, the European Structural and Investment Funds (ESIF), or other relevant funds. Please note, however, that reference to such additional or follow-up funding will not lead automatically to a higher score in the evaluation of the proposal.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. This means proposals should bring together from the early start multiple types of

scientific expertise in both natural sciences (e.g., ecology, climate, pedology) and social sciences and humanities (e.g., economics, geography, sociology) together with a variety of urban and/or rural community representatives, farmers, businesses, civil society organisations and citizens.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

Proposals should set out a clear plan on how they will collaborate with other projects selected under this topic and any other relevant topic/call, by participating in joint activities, workshops, as well as common communication and dissemination activities. This includes notably the Horizon 2020 NBS project portfolio, including the European Green Deal Call, and its task forces; Horizon Europe projects Invest4Nature and Naturance and HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions. Applicants should plan the necessary budget to cover these activities without the prerequisite to define concrete common actions at this stage.

Proposals should ensure complementarity and foresee synergies with the activities of the Horizon Europe missions "A Soil Deal for Europe", "Restore our Ocean and Waters by 2030" and "Adaptation to Climate Change", as well as with the partnerships Biodiversa+ and Water4All.

Proposals should ensure that all evidence, information and project outputs will be accessible through the Oppla portal (the EU repository for NBS). Where relevant, proposals should consider creating links, contributing to and using the information and data of other platforms such as NWRM, Climate-ADAPT, BISE and the European Drought Observatory.

HORIZON-CL6-2024-BIODIV-02-2-two-stage: Demonstrating the potential of Nature-based Solutions and the New European Bauhaus to contribute to sustainable, inclusive and resilient living spaces and communities

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms,

	logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.
<i>Evaluation Procedure</i>	To ensure a balanced portfolio covering demonstration activities in diverse geographical areas of the European Union and Associated Countries, grants will be awarded first to the highest ranked application according to the standard procedure described in Horizon Europe General Annexes D and F, followed by other applications that are the highest ranked among those that ensure the most complementary geographical coverage, provided that the applications attain all thresholds. When assessing geographical coverage, the evaluation will take into account the location of the application's demonstration activities, not the location of the application's participants/beneficiaries.

Expected Outcome: In line with the European Green Deal priorities and the EU climate adaptation strategy, as well as the EU's climate ambition for 2030 and 2050 and the EU biodiversity strategy for 2030, the successful proposals will support the development of Nature-based Solutions (NBS) contributing to the resilience and the sustainable, balanced and inclusive development of urban, peri-urban and rural areas.

The overall aim of this topic and associated R&I activities is to leverage the New European Bauhaus (NEB) core values of sustainability, inclusion and aesthetics in Nature-based Solutions (NBS), in light of a wider transformation to enable a more sustainable, inclusive and resilient society.

Project results are expected to contribute to all of following expected outcomes:

- A transdisciplinary integration of NBS and the NEB is demonstrated in different contexts, contributing to the transformative change needed to tackle the climate and biodiversity crises, and drawing on inclusiveness and the pluralities of values, knowledge, cultural diversity and cultural heritage.
- High quality, multifunctional, co-created public spaces that enhance sustainability, resilience and the well-being of communities, through the combination of NBS and the NEB, with digital, social and cultural innovation.
- Greater understanding of the links between NBS and the NEB and how to better make these two approaches compatible and integrated in places and buildings, landscapes, industrial systems, policies and communities.

- Communities benefit from the implementation of a new societal vision encompassing sustainability, resilience, health, well-being and inclusion, based on the demonstration of the combination of the NEB with NBS.

Scope: NBS can be an integral part of our living spaces that contribute to our well-being, promote togetherness and connect to our cultural heritage. There is growing evidence that NBS are a valuable entry for transforming behaviour towards sustainability, while contributing with multiple benefits that help communities address different societal challenges – from microclimate regulation to climate change, water management, green job creation, tourism opportunities, urban regeneration, health and well-being.

The NEB aims to make the European Green Deal a positive and tangible experience for citizens, connecting it to our daily lives and living spaces. It is a bridge between the world of science and technology, art and culture and is about leveraging our green and digital challenges to transform our lives and society. By integrating the values of sustainability, inclusion and aesthetics/quality of experience, the NEB supports the development of holistic solutions to global challenges through a place-based, participatory, and transdisciplinary approach.

The systemic integration of social, cultural, digital and nature-based innovation in the design, development and governance of public space has a tremendous potential to transform these spaces into diverse, accessible, safe, inclusive and high-quality areas that increase well-being and health and deliver a fair and equitable distribution of the associated benefits.

It becomes important to analyse the potential of NBS in view of the NEB initiative and conceptualise and demonstrate how to link these two approaches, avoid trade-offs, and enhance synergies and complementarities, through local demonstration. In this regard, proposals should focus on the first transformation of the NEB (places), while also integrating, when possible, the other two transformations (ecosystem of innovation; diffusion of new meanings) in the process.

The successful proposals should:

- Deliver visionary and integrated solutions combining nature-based innovation and social, cultural, or digital solutions, with the NEB approach, in order to increase sustainability and resilience of communities and citizens' well-being. These solutions should address environmental, social, cultural, economic determinants of resilience and well-being and support communities in reducing their exposure to climate-related risks, pollution (including noise) and social tensions.
- Demonstrate how the integration of NBS and NEB in solutions for innovative land-use management, urban design and planning could enhance ecosystem services, foster equitable access to public spaces, enhance their quality and use, or promote sustainable mobility.

- Considering the existing NBS portfolio, further demonstrate NBS, enriched with the new elements brought by the NEB (e.g., aesthetics, quality of experience), as well as with concerns on the circularity, ecodesign, origin and sustainability of materials used. These solutions should be applied in innovative configurations, e.g., in protected areas, ecotourism sites, transport infrastructure, educational and cultural buildings, etc, notably contributing to urban regeneration, tourism opportunities, green job creation, social inclusion, or health and well-being.
- Considering that NBS inherently should always enhance biodiversity, explore the connections and possible trade-offs (and propose ways to overcome them) between biodiversity targets in NBS and the NEB, including in what concerns functionality and aesthetics/quality of experience.
- Propose solutions that involve innovative ways to make NBS compatible with built cultural heritage (e.g., cultural landscapes), and explore the possible role of NBS in increasing built cultural heritage's resilience to climate change and natural disasters.
- Propose and test guidelines and innovative tools for the implementation, maintenance, monitoring and evaluation of NBS integrating the NEB approach (e.g., addressing issues of design/ergonomics or quality of experience), as well as the necessary business and governance models for their implementation and upscaling (e.g. local incentives for NBS in public and private spaces; exploring different forms of engagement, inclusion and stewardship, etc).
- Building on the approach of the NEB, develop place based NBS with strong citizen engagement (e.g., youth, elder, vulnerable communities), through social innovation, and the necessary tools for citizen participation and the co-creation of solutions.
- Incorporate outreach, dissemination and cooperation activities with local communities, industry, educational institutions, research centres, professional organisations or museums and other cultural organisations, supporting challenge-based and experiential NBS with real-life NEB applications, promoting public debate and a change of behaviour.
- Engage, through sustainable transdisciplinary collaborations, communities of practice that very rarely work together (e.g., architects, landscape architects, designers, artists, ecologists, spatial planners, psychologists, economists, or engineers), bridging epistemological gaps, while also contributing to the breaking up of silos in local/regional administrations.
- Explore the role of NBS and NEB in transformative change to provide holistic solutions to address global challenges (climate, biodiversity, water, economic, demographic, etc), including through transformative and contemporary arts.

Proposals should address all of the above points.

For wider impact, proposals should ensure a diversity of demonstration contexts (e.g., urban, rural, protected areas) and geographical representation, as well as the inclusion of a diversity of actors for local demonstration: local and/or regional authorities, business, academia, and civil society.

Other than the critical role of ecological sciences, this topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The involvement of disciplines such as psychology, behavioural science, economics, geography, anthropology, sociology, architecture, arts, cultural heritage, or design studies, is considered essential to the diffusion of new meanings, enhance social learning and promote the role of social and cultural innovation in transforming public spaces, with particular attention to inclusion, quality of experience and cultural perceptions of nature.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership, or market uptake.

Because of the substantial investments that might be necessary for implementing the NBS, additional or follow-up funding (private or public) should be sought, including from relevant regional/national schemes under the Recovery and Resilience Fund, the European Structural and Investment Funds (ESIF), or other relevant funds.

Projects should envisage clustering activities with the projects of the same topic and with the Horizon 2020 NBS project portfolio and respective task forces and notably coordinate with Horizon Europe projects resulting from: HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities; HORIZON-CL6-2022-COMMUNITIES-02-02-two-stage: Developing nature-based therapy for health and well-being; HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions; and HORIZON-CL6-2023-BIODIV-01-8: Addressing biodiversity decline and promoting Nature-based Solutions in higher education. Collaboration with the European Biodiversity Partnership (Biodiversa+) should also be explored. To this end, proposals should foresee dedicated tasks and appropriate resources for coordination measures, foresee joint activities and joint deliverables.

Proposals should build on existing outcomes of the Horizon 2020 and Horizon Europe NBS project portfolio and other NEB related projects funded in Horizon Europe and ensure the proposed activities are complementary. Complementarity should also be sought with Horizon Europe Missions, notably “100 Climate-Neutral and Smart Cities by 2030”, “Restore our Ocean and Waters by 2030” and “Adaptation to Climate Change”.

Projects are expected to contribute to the NEB initiative by interacting with the NEB Community, NEBLab and other relevant actions of the NEB initiative through sharing information, best practice, and, where relevant, results.

Proposals should ensure that all evidence, information, and project outputs will be accessible through the Oppla portal (the EU repository for Nature-based solutions).

In the context of this topic, geographical areas of the European Union and Associated Countries are NUTS level 1 regions of European Union Member States and of Associated Countries for which they are defined. In the case of Associated Countries without NUTS classification, the country as a whole is to be considered as one geographical area:

- List of Associated Countries not defined by NUTS level 1: Armenia; Bosnia and Herzegovina; Faroe Islands; Georgia; Kosovo¹²²; Israel; Moldova; Tunisia; Ukraine.
- List of countries not defined by NUTS level 1 with which association negotiations are being processed or where association is imminent: Morocco.

Biodiversity friendly practices in agriculture, forestry and aquaculture

HORIZON-CL6-2024-BIODIV-02-3-two-stage: Promoting minor crops in farming systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Procedure</i>	The procedure is described in General Annex F. The following

¹²² This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

	exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.
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Expected Outcome: In line with the objectives of the farm to fork and biodiversity strategies, successful proposals will promote diversification in agriculture as a means to increase the resilience and sustainability of the sector vis-a-vis challenging environmental, climatic and economic conditions. By increasing agrobiodiversity, activities will contribute to food security, adaptation of the agricultural production to the effects of climate change, and thereby support implementation of the farm to fork strategy, the common agricultural policy and the EU climate policy under the European Green Deal.

Successful proposals will contribute to the following outcomes:

- Increased evidence of the environmental benefits of minor crops;
- Farmers make use of a wider range of crops, and combination of crops;
- Minor crops are integrated in farming systems promoting their environmental benefits;
- Increased resilience and climate adaptation of farming systems vis-a-vis biotic and abiotic stresses;
- Feed and food industry make use of minor crops;
- Creation of new avenues for farmers and value chains through a wider range of products.

Scope: Farmers face increasing pressure to shift production towards lower input systems, while continuing to ensure sufficient supplies of food and non-food products. The European Green Deal in particular has set ambitious targets to reduce by 2030 the overall use of chemical pesticides and fertilisers, reduce nutrient losses and increase organic farming¹²³. Activities shall release the value of minor crops and promote their broader use in breeding, farming and in food/non-food value chains. For the purpose of this topic, minor crops are defined as underutilised and/or genetically diverse crops¹²⁴ (including landraces and varieties).

- Promote the access to minor crops engaging in breeding activities;
- Improve agronomic management practices for minor crops;

¹²³ European Green Deal farm to fork and biodiversity strategies with 2030 targets: Reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides; reduce nutrient losses by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of fertilisers by at least 20 %; achieve at least 25% of the EU's agricultural land under organic farming.

¹²⁴ Applicants are expected to explain and justify the choice of crops (including tree and other perennial crops) in relation to the proposal's and topic's ambition.

- Explore the effects and benefits of minor crops and demonstrate the ecosystems services supported by farming system diversification and the integration of minor crops (if applicable, including novel crop rotations).
- Identify and test avenues for marketing and processing of more diverse farming outputs across the value chain;
- Promote the uptake of minor crops through the development of guidelines and wide-spread practical demonstrations taking into account a range of farming systems, pedo-climatic conditions and value chains;
- Support capacity building, training and education enabling farmers/growers to adopt sustainable agricultural practices.

The topic is open to all types of farming systems (e.g., arable farming, horticulture, fruit trees) in various geographical and pedo-climatic conditions. Result of activities should benefit both conventional and organic agriculture.

Activities must implement the multi-actor approach, thus ensure an adequate involvement of researchers, farmers, advisors, food industry, and other players in the value chain and consumers. Communication and outreach to a wide range of stakeholders is essential. This topic should include the effective contribution of SSH disciplines.

Where relevant, proposals should seek complementarities and synergies, while avoiding duplication and overlap, with relevant actions funded under Horizon 2020¹²⁵. Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics, for example by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

¹²⁵ Projects from topic Horizon 2020 SFS-01-2020 - Biodiversity in action: across farmland and the value chain: RADIANT (Grant agreement ID: 101000622), CROPDIVA (Grant agreement ID: 101000847), DIVINFOOD (Grant agreement ID: 101000383) and BIOVALUE (Grant agreement ID: 101000499)

Destination - Fair, healthy and environment-friendly food systems from primary production to consumption

National, EU and global food systems are facing sustainability challenges, from primary production to consumption that could jeopardise food and nutrition security. The farm to fork strategy, and its follow-up initiatives, aim to address these challenges and supports transition to more resilient and environmentally, socially and economically sustainable food systems on land and at sea that provide healthy diets for all and respect planetary boundaries. It is key to ensuring that the fit for 55 package¹²⁶ and the European Green Deal¹²⁷ are successful and the UN Sustainable Development Goals (SDGs)¹²⁸ are achieved. Research and innovation (R&I) under this destination will steer and accelerate the transition to sustainable, safe, healthy and inclusive food systems from farm to fork, ensuring food and nutrition security for all and delivering co-benefits for the environment, health, society and economy.

Sustainable, climate neutral and biodiversity friendly farming systems provide economic, social (including health), environmental and climate benefits, and are the main prerequisite for food and nutrition security. For farmers, who are the backbone of food systems and principal managers of natural resources, the new common agricultural policy (CAP) and the European Green Deal set ambitious targets and objectives concerning the sustainability and safety of feed, food and non-food production. These targets and objectives are included in the core European Green Deal policy priorities, in particular the farm to fork strategy, the EU biodiversity strategy for 2030, zero pollution ambitions and climate action, and their follow-up initiatives. R&I in line with the strategic approach to EU agricultural research and innovation¹²⁹ will be key enablers for achieving these ambitious targets and objectives.

The **partnership on ‘Accelerating farming systems transition: agroecology living labs and research infrastructures’** will unlock the potential of agroecology to make agri-food systems environmentally friendly and regenerative, climate-neutral, inclusive, competitive and resilient. It will enable farmers and value chain actors to successfully apply agroecology principles thanks to: i) a stronger R&I system integrating science and practice; ii) increased knowledge on the benefits, challenges and potential of agroecology for farming, food and society; iii) improved sharing of and access to knowledge, place-based tailored solutions and innovations; and iv) improved and transformative governance and policies.

Besides the partnership, R&I under the destination will help farmers in monitor and manage natural resources (e.g. soil, water, nutrients, biodiversity, etc.) in innovative, sustainable ways by, among other things, boosting organic food and farming in line with the action plan for the

¹²⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN>

¹²⁷ [EUR-Lex - 52019DC0640 - EN - EUR-Lex \(europa.eu\)](#)

¹²⁸ [THE 17 GOALS | Sustainable Development \(un.org\)](#)

¹²⁹ <https://ec.europa.eu/programmes/horizon2020/en/news/final-paper-strategic-approach-eu-agricultural-research-and-innovation>

development of organic production¹³⁰. New knowledge and innovative solutions will also promote plant health, reduce farmer's dependency on pesticides and reverse biodiversity loss.

Through the **partnership on 'Animal health and welfare'**, farmers and other actors will be better equipped to protect animals against infectious diseases, including zoonoses, and to improve animal welfare, while reducing the dependency on antimicrobials, maintaining productivity, improving food safety and quality, and protecting the environment and public health. In addition to the partnership, sustainable livestock production will be enhanced by improved knowledge on nutritional requirements and innovative on-farm practices and technologies for optimised production and use of local feedstuffs. A common EU approach to optimise the management of the co-existence of outdoor livestock systems and wildlife will be implemented by integrating science, local knowledge and practice on the preservation, protection and valorisation of wildlife and agro-pastoral systems.

Synergies will be created with other destinations and instruments. Under the Mission 'A Soil Deal for Europe', 100 living labs and lighthouses will be established to lead the transition towards healthy soils by 2030¹³¹. Thanks to R&I, farming systems will also maximise the provision of a wide range of ecosystem services from more sustainably managed EU agro-ecosystems and landscapes and help reverse the loss of biodiversity while ensuring resilient primary production (Destination '*Biodiversity and ecosystem services*'). R&I under the Destination '*Land, ocean and water for climate action*' will better equip farmers to make a significant contribution to climate-neutrality and become more resilient to climate change. Farmers will be empowered and interconnected by means of advanced digital and data technologies (e.g. AI, IoT, and robotics) that support sustainable farming approaches (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal*'). New sustainable business models and strengthened EU quality schemes will improve the position of farmers in value chains and enable them to seize opportunities provided by the green transition (Destination '*Resilient, inclusive, healthy and green rural, coastal and urban communities*'). Effective agricultural knowledge and innovation systems (AKIS) will speed up innovation and the uptake of R&I results from farm to fork (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal*').

Better evidence-based knowledge and analytical capacity will help policymakers develop and implement effective policies, in particular the CAP post 2027, the contingency plan and sustainable food systems framework law, enabling farmers to transition to sustainable and resilient farming and food systems (Destination '*Innovative governance, environmental observations and digital solutions in support of the Green Deal*'). Furthermore, knowledge and innovative solutions generated under Horizon Europe will be circulated and tested in local innovation projects and networks that are financed by rural development programmes, and

¹³⁰ https://eur-lex.europa.eu/resource.html?uri=cellar:13dc912c-a1a5-11eb-b85c-01aa75ed71a1.0003.02/DOC_1&format=PDF

¹³¹ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/soil-health-and-food_en

which are managed by the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI).

Sustainable fisheries and aquaculture contribute directly to environmentally friendly, resilient, inclusive, safe and healthy food production by providing highly nutritional proteins, lipids and micronutrients for a healthy diet. Sustainable aquatic production can and should account for a much bigger proportion of our overall food consumption. Following the farm to fork strategy, production methods should make the best use of nature-based, technological, digital and space-based solutions, optimising the use of inputs (e.g., nutrients and antimicrobials), therefore increasing climate-neutrality and resilience and safeguard aquatic biodiversity. R&I in fisheries and aquaculture will contribute to the relevant Food 2030 pathway for action ‘food from oceans and freshwater resources’¹³². It will support the ‘strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030’, that propose specific actions on, e.g. i) access to space and water, ii) human and animal health, iii) environmental performance, iv) climate change, v) animal welfare, vi) the regulatory and administrative framework, and vii) communication on EU aquaculture. In addition, the new EU algae initiative - to unlock the full potential of sustainable algae-based food and alternative feed sources - can support the transition to sustainable food systems. R&I will also contribute to the success of the common fisheries policy and deliver compliant, inclusive, diversified ecosystem-based fisheries approaches to allow fisheries management to adapt to different realities, including in the international context. The destination will also support the new policy initiative on the sustainable blue economy and its offshoot initiatives, including the Sustainable Blue Economy Partnership.

R&I will help fisheries and aquaculture become more precise, technologically advanced, and fully embedded in the natural and socio-ecological context including by reducing the footprint on aquatic biodiversity. It will better equip fisheries and aquaculture to become more resilient to the adverse consequences of climate change and to make a significant contribution to climate neutrality. It will enable the European aquaculture industry to achieve its full potential to ensure global food security in terms of volume, methods, variety of species, aquatic species welfare, safety and quality of products and services.

R&I will help to provide a better understanding of the impacts of climate change in terms of habitat change and ecological functioning and the consequent repercussions on stock shifts, species composition, health, and altered growth and reproduction rates. This will help in the adaptation of fishing vessels, fishing gear and catch methods to reduce their carbon footprint as well as help in their adaptation to the changing climate regime. It will also enable aquaculture to: i) become more sustainable – by using resources in a highly efficient manner - and climate-neutral; and ii) adapt to a changing climate and its consequences, such as temperature rise, acidification, altered water quality and availability, extreme weather events, and other emerging risks, notably in geographical areas particularly vulnerable to climate change impacts such as the EU's outermost regions (defined in article 349 TFEU).

¹³²

<https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1>

Sustainable, healthy and inclusive food systems rely on systemic, cross-sectoral and participatory, multi-actor approaches and on integration between policy areas at all levels of governance. Food systems are to be understood as covering, 'from farm to fork', all the sectors, actors and disciplines relevant to and connecting i) environment protection requirements, ii) natural resources, iii) primary production on land and at sea, iv) food processing and packaging, v) food distribution and retail, vi) food services, vii) food consumption, viii) food safety, ix) nutrition and public health, and x) food waste streams. An important driver for transforming food systems should be the integration of sectors, actors and policies¹³³. This should occur in order to better understand the multiple interactions between the actors and components of current food systems, the lock-ins and potential leverage points for synergistic changes and of the interdependencies of outcomes (linkages between nutritional climate and sustainability outcomes). Such implementation/approaches can provide solutions that maximise co-benefits with respect to the four priorities of the Commission's Food 2030 R&I initiative:

- nutrition and health, including food safety;
- climate and environmental sustainability;
- circularity and resource efficiency;
- innovation and empowering communities.

This destination will deploy solutions to the 10 Food 2030 pathways for action¹³⁴ and will help build innovation ecosystems to bring together relevant public and private sector actors, researchers and society. R&I will provide food-related businesses, including those involved in food processing and packaging, retail, distribution, and food services, with opportunities and incentives to stimulate environmentally friendly, healthy, circular and diversified practices, products and processes that are biodiversity-friendly, climate-neutral and less reliant on fossil fuels. It will also help devise tools and approaches that enable the shift to healthy, sustainable diets and responsible consumption for everyone, boosted also by social innovation, technology, behavioural change and marketing standards, and by inclusively engaging with different consumers, citizens and communities. R&I will accelerate the transition to sustainable, healthy and inclusive food systems by:

- eradicating micronutrient deficiencies in vulnerable population groups;
- developing new high quality, healthy, minimally processed and sustainable food products and processes;
- assessing innovative and novel foods based on sustainable alternatives sources of proteins;

¹³³ Scientific Advice Mechanism, [Towards a sustainable food system - Publications Office of the EU \(europa.eu\)](https://publications.europecouncil.europa.eu/publications/86e31158-2563-11eb-9d7e-01aa75ed71a1)

¹³⁴ <https://op.europa.eu/en/publication-detail/-/publication/86e31158-2563-11eb-9d7e-01aa75ed71a1>

- preventing and reducing food loss and waste to tackle environmental and climate challenges, including through improved marketing standards;
- unlocking and maximising the potential of the microbiome to improve food safety, fight food waste and develop alternative sources of proteins;
- networking and exchanging knowledge on food fraud and food safety and exploring the influence of climate change on food safety;
- developing new strategies and detection methods on products derived from new genomic techniques, and strengthening the resilience of European food systems;
- promoting citizen science and creating smart tools to improve diets.

R&I will also:

- reduce the environmental impacts of and pollution from food value chains (see Destination ‘*Clean environment and zero pollution*’);
- help transform urban food systems, including via the use of nature-based solutions in the context of the New European Bauhaus initiative (see Destination ‘*Resilient, inclusive, healthy and green rural, coastal and urban communities*’); and
- improve the governance of food systems and further develop digital and data-driven innovation ecosystems for sustainable, healthy and inclusive food systems (see Destination ‘*Innovative governance, environmental observations digital solutions in support of the Green Deal*’).

In addition, R&I under the **partnership on ‘Sustainable food systems for people, planet and climate’** will accelerate the transition towards sustainable, healthy and inclusive food systems in Europe and beyond via EU-wide targeted research and innovation. It will help to close knowledge gaps, increase health and food literacy, and deliver innovative solutions, e.g. social innovation, which provide co-benefits for nutrition, the environment, climate, circularity and communities. It will also leverage investments and align multiple actors towards common goals and targets and help further build up the European Research Area in order to support the transformation of sustainable food systems at various scales from local to global.

The EU also aims to promote a ***global transition to sustainable food systems***. It’s relationship with Africa is a key priority. Targeted R&I activities, in particular under the EU-Africa Partnership on Food and Nutrition Security and Sustainable Agriculture (FNSSA) and global initiatives involving international research consortia, will help achieve this ambition and contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation.

In line with the farm to fork strategy, and its promotion of global transitions on sustainable food systems, a comprehensive and integrated response to current and future challenges

benefiting people, nature and economic growth in Europe and in Africa will be provided. Advances will be made particularly in the following key areas: agroecology, including agroforestry, food safety and fair trade.

In encouraging multi-actor approaches and to be more effective in achieving impact, the proposals in this destination shall, where relevant, be complementary or build on synergies with the activities of the EIT Knowledge and Innovation Communities, such as EIT Food.

Where appropriate, proposals are encouraged to cooperate with actors such as the European Commission Knowledge Centre for Global Food and Nutrition Security¹³⁵ and the Africa Knowledge Platform¹³⁶, also for the purpose of dissemination and exploitation of results.

Expected impact

Proposals for topics under this destination should set out a credible pathway contributing to **fair, healthy, safe, climate- and environment-friendly, sustainable and resilient food systems from primary production to consumption, ensuring food and nutrition security for all within planetary boundaries** in Europe and across the world.

More specifically, proposed topics should contribute to one or more of the following impacts:

- enable **sustainable farming systems** that i) provide consumers with affordable, safe, healthy and sustainable food, ii) increase the provision of ecosystem services, iii) restore and strengthen biodiversity, iv) minimise pollution and pressure on ecosystems and greenhouse gas emissions, v) foster plant, animal and public health, vi) improve animal welfare, and vii) generate fair economic returns for farmers;
- enable **sustainable fisheries and aquaculture**, in marine and inland waters, increasing aquatic multi-trophic biomass production in a way compatible with the protection of aquatic ecosystems and biodiversity, and the diversification of fisheries and aquaculture products, for fair, healthy, climate-resilient and environment-friendly food systems with a lower impact on aquatic ecosystems and improved animal welfare;

accelerate the transition to **sustainable, healthy and inclusive food systems**, delivering co-benefits for climate change mitigation and adaptation, environmental sustainability and circularity, sustainable healthy diets and nutrition, food poverty reduction, empowered citizens and communities, and flourishing food businesses, while ensuring food safety and the economic sustainability of EU food systems during the transition.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	

¹³⁵ https://knowledge4policy.ec.europa.eu/global-food-nutrition-security_en

¹³⁶ <https://africa-knowledge-platform.ec.europa.eu/>

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HORIZON-CL6-2023-FARM2FORK-01	196.50	92.50	12 Apr 2023
HORIZON-CL6-2024-FARM2FORK-01		95.00	22 Feb 2024
HORIZON-CL6-2024-FARM2FORK-02		69.00	22 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)
Overall indicative budget	196.50	256.50	

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2023-FARM2FORK-01

Conditions for the Call

Indicative budget(s)¹³⁷

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million) ¹³⁸	Indicative number of projects expected to be funded
		2023	2024		
Opening: 22 Dec 2022 Deadline(s): 12 Apr 2023					
HORIZON-CL6-2023-FARM2FORK-01-1	COFUND	30.00	30.00	Around 60.00	1
HORIZON-CL6-2023-FARM2FORK-01-10	RIA	9.00		Around 9.00	1
HORIZON-CL6-2023-FARM2FORK-01-11	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-12	CSA	2.00		Around 2.00	1
HORIZON-CL6-2023-FARM2FORK-01-13	RIA	7.00		Around 7.00	1
HORIZON-CL6-2023-FARM2FORK-01-14	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-	RIA	8.00		Around	1

¹³⁷ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

¹³⁸ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

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FARM2FORK-01-15				8.00	
HORIZON-CL6-2023-FARM2FORK-01-16	IA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-17	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023-FARM2FORK-01-18	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023-FARM2FORK-01-19	IA	7.00		Around 7.00	1
HORIZON-CL6-2023-FARM2FORK-01-2	COFUND	20.00	40.00	Around 60.00	1
HORIZON-CL6-2023-FARM2FORK-01-20	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-FARM2FORK-01-3	CSA	8.00		Around 4.00	2
HORIZON-CL6-2023-FARM2FORK-01-4	CSA	1.00		Around 1.00	1
HORIZON-CL6-2023-FARM2FORK-01-5	RIA	12.00		Around 6.00	2
HORIZON-CL6-2023-FARM2FORK-01-6	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023-FARM2FORK-01-7	IA	12.00		Around 6.00	2
HORIZON-CL6-2023-FARM2FORK-01-8	IA	5.00		Around 5.00	1
HORIZON-CL6-2023-FARM2FORK-01-9	COFUND	22.50	22.50	Around 45.00	1
Overall indicative budget		196.50	92.50		

General conditions relating to this call

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General

	Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling sustainable farming systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-1: European partnership on accelerating farming systems transition – agroecology living labs and research infrastructures

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 60.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: The funding rate is 50% of the eligible costs. This is justified by the pooling of proposers' in-kind contributions and in-house activities and by the nature of activities to be performed. Beneficiaries may provide financial support to third parties. The support

	to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.
<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR 150 million.

Expected Outcome: In line with the European Green Deal, this partnership will contribute to the objectives and targets of the new common agricultural policy (CAP), and of the EU farm to fork strategy for a transition to fair, healthy, environmentally-friendly and more resilient food systems from primary production to consumption, and in particular pursuing the ambition to boost agroecology. Moreover, the Commission Communication ‘Safeguarding food security and reinforcing the resilience of food systems’¹³⁹ highlights innovation through agroecology as one of the tools that can mitigate pressure on input costs without hurting production capacity, leading to long-term progress in productivity. Agroecology is a dynamic and holistic approach that contributes positively to healthier ecosystems and biodiversity, including in soils. Agroecology aims at supporting the transition of agri-food systems towards more sustainable practices by connecting science, practice and society and by triggering the adoption of a set of policies to promote sustainable agricultural practices. Given the potential of agroecology to deliver positive impacts for the transition towards environmental, climate, economic and social sustainability of Europe’s farming systems, the partnership will deliver solutions that will support the implementation of several other European Green Deal strategies and initiatives, notably: the EU biodiversity strategy for 2030; the action plan for the development of organic production; the EU zero pollution action plan; the 2030 climate target pact; the EU soil strategy for 2030, the sustainable carbon cycles, and the EU bioeconomy strategy. The partnership will constitute a unique instrument that will help connect agroecological research across Europe. Its expected outcomes will contribute to the impacts of various Destinations under Cluster 6 of Horizon Europe, notably Destination ‘Fair, healthy and environmentally-friendly food systems from primary production to consumption’, as well as to the Sustainable Development Goals (SDGs), in particular SDGs 2, 3, 6, 12, 13 and 15.

The partnership’s activities are expected to contribute to all of the following expected outcomes:

- Increased capacities of farmers and actors of the land-based primary production value chains across Europe to implement agroecological practices that contribute to sustainable

¹³⁹ https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

ecological, climate, environmental and productivity impacts, and to inclusive, competitive and resilient agri-food systems.

- A Europe-wide network of existing and new agroecology living laboratories and research infrastructures is set. Knowledge sharing and multi-stakeholder co-creation of agroecological innovations at various scales is ensured. A framework for data management, indicators, and tools to monitor agroecology transition is put in place.
- A robust European R&I system for agroecology integrating science and practice is put in place. The direction for expanding existing and building up new collaborations, boosting knowledge creation and sharing, and co-creating place-based and tailored solutions through agroecology living laboratories ('living labs') and research infrastructures is set. The understandings of the technical and socio-economic performance and the uptake of agroecology in Europe are improved.
- The science-policy dialogue on agroecology is strengthened. Scientific support and technical demonstrations for the development, implementation, monitoring and evaluation of relevant EU policies is provided. Evidence-based, systems-oriented and transformative governance and policy-making are supported.
- EU and national/regional agroecological research and innovation agendas from the EU and Member States and Associated Countries are complementary, leading to the co-creation and implementation of a long-term pan-European strategic research and innovation agenda.

Scope: The European partnership on 'Accelerating farming systems transition: agroecology living labs and research infrastructures' is one of the actions included in the farm to fork strategy, which calls for the promotion of agroecology as one of the sustainable farming approaches with capacity to help meet the European Green Deal objectives in relation to agri-food systems. Living laboratories are multi-stakeholder, real-life settings that place the user at the centre of innovation and operate as instruments for farmers, research organisations, companies, citizens, local and regional authorities, etc., for the co-creation of solutions following a multi-method approach. Agroecology living labs are characterised by very strong local embeddedness, multi-stakeholder involvement by a large diversity of origins, and knowledge intensiveness in the pursuit of and the innovations needed and produced. They can operate at different scales: typically farm, landscape or regional levels. Research infrastructures provide a wide range of services for research communities working in a long-term perspective.

The partnership should coordinate research and innovation programmes on agroecology between the EU and its Member States and Associated Countries and trigger combined actions. It should mobilise key partners and stakeholders, including ministries, funding agencies, research performing organisations, regions, local authorities, research infrastructures, living laboratories, farmers, advisors, industry, consumers, etc.

The partnership's co-created Strategic Research and Innovation Agenda (SRIA) should include calls for research projects and activities to boost place-based and multi-stakeholder co-creation of solutions. As such, it should boost fundamental research on agroecology through to applied research, and should give rise to ready-to-use solutions for scaling up in real-life environments. The partnership should cover issues pertaining to the transition to agroecology in all agricultural production systems, including but not limited to conventional agriculture, organic farming, agroforestry, permaculture, regenerative agriculture, urban farming, etc. Ultimately, the partnership should significantly contribute to filling existing knowledge gaps on agroecology, addressing geographical/territorial specificities in the EU and Associated Countries.

Delivering on the partnership's ambitions requires the implementation of the following portfolio of activities to be achieved during the partnership's lifetime:

- Support transnational research and innovation activities, as defined in its SRIA, on the challenges and potential of agroecology in addressing biophysical, climate, social and economic dimensions of sustainability, as well as for reducing environmental impact and resource use, at farming, local environment and broader societal levels. This should include supporting research in and on agroecology living labs as tools to foster agroecology transition.
- Build a European network of new and existing living labs and research infrastructures for knowledge sharing and co-creation of agroecology innovations, at various scales. The network will constitute a key platform for the development and co-creation of innovations to address the technical, economic, institutional and policy-related challenges of agroecology transition for both individuals and collectives across Europe.
- Improve access to and use of services provided by research infrastructures and other relevant initiatives, for long-term measurement, observation and experimentation in support of agroecology.
- Improve the sharing and access to knowledge and innovation on agroecology, and improve the capacities of farmers and actors of the agri-food chain to take up agroecology innovations, as well as reinforce the agricultural knowledge and innovation systems for agroecology across Europe, considering culture, gender, and youth aspects.
- Build a monitoring and data framework with indicators and tools to monitor and measure the progress of agroecology transition, its social, economic, environmental and climate performances and impacts, and improve data valorisation and sharing.
- Put in place robust mechanisms for science-policy dialogue to support the development, implementation, monitoring and evaluation of policies (research and sectorial) with a view to contributing to improved governance and policies, as well as institutions that are better equipped to support agroecological transition.

- Design and implement communication, knowledge sharing and dissemination activities to improve stakeholder and wider public engagement in agroecology transition.

The partnership is open to all EU Member States, as well as to Countries Associated to Horizon Europe. Partners are expected to provide financial and/or in-kind contribution, in line with the level of ambition of the proposed activities. The partnership should be open to include new partners over its lifetime. Its governance should allow for engaging a broad range of stakeholders, together with the full members of the partnership. Guidelines, standards and legislation in the field should be taken into consideration, to facilitate the marketing of the methods and products developed in the partnership.

To ensure that all work streams are coherent and complementary, and to leverage knowledge and innovation investment potential, the partnership is expected to foster close cooperation and synergies with the Horizon Mission ‘A Soil Deal for Europe’, with the existing European Partnership Biodiversa+, and with other relevant future partnerships, in particular Sustainable food systems, Agriculture of data, and Animal health and welfare.

Cooperation with the JRC may be envisaged, in particular for actions related to monitoring and measuring progress of agroecology transition, as well as for improving data valorisation. The JRC may provide expertise on EU-wide data and indicators to monitor agroecology transition.

The partnership should allocate resources to cooperate with existing projects, initiatives, platforms, science-policy interfaces, and/or institutional processes at EU level, and at other levels where relevant to the partnership’s goals.

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties. The partnership will provide financial support to third parties as one of the means to achieve its objectives. To explore the full range of financing options available under Horizon Europe, the general annexes of the main Work Programme setting out the general conditions applicable to calls and topics for grants should be considered.

To achieve the international cooperation objectives, and given the global dimension of agroecology, collaboration with strategic third country partners with proven added value in the field of agroecology transition is strongly encouraged. In particular, the participation of legal entities from international countries and/or regions, including those not automatically eligible for funding, is encouraged in the joint calls and/or in other activities of the partnership. Cooperation with international organisations may be considered.

Applicants are expected to describe in detail how they would carry out this collaborative work in practice.

Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

This topic should involve the effective contribution of social sciences and humanities disciplines.

In order to enhance the societal impact of the activities, the approach should empower citizens to contribute to the co-design/co-creation/co-assessment of research and innovation agendas/contents/outcomes.

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud should be foreseen, exploiting synergies and complementarities of the different approaches.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

The expected duration of the partnership is seven to ten years.

HORIZON-CL6-2023-FARM2FORK-01-2: European partnership on animal health and welfare

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 60.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>The funding rate is 50% of the eligible costs. This is justified by the pooling of proposers' in-kind contributions and in-house activities and by the nature of activities to be performed.</p> <p>Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.</p>
<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR 180 million.

Expected Outcome: In line with the European Green Deal, this partnership will contribute to the objectives and targets of the new common agricultural policy (CAP) and the EU farm to fork strategy, for a transition to fair, healthy and resilient animal production systems, including the reduction of anti-microbial usage and improvement of animal welfare. A successful proposal will support research and innovation to help policy makers, animal health industry and other relevant actors to provide society with reassurance on the prevention and control of infectious animal diseases with appropriate means, where antimicrobials are prudently used, where animal welfare is respected and improved, thus contributing to sustainable animal farming and harvesting and the protection of public health and the environment.

The expected outcomes of the topic will also contribute to other impacts of Destination ‘Fair, healthy and environmentally-friendly food systems from primary production to consumption’, as well as to the Sustainable Development Goals (SDGs), in particular SDGs 2, 3, to the One Health approach and to the CAP. It will contribute to the climate adaptation strategy, by fostering adaptation to climate change of livestock production.

The partnership is expected to contribute to all the following expected outcomes:

- Animal health and welfare research and innovation agendas from the EU and Member States and Associated Countries are complementary, leading to the co-creation and implementation of a long-term pan-European strategic research and innovation agenda, strengthening the European Research Area in the area of animal health and welfare.
- A robust European R&I system for animal health and welfare is put in place. The direction for expanding existing collaborations and building up new ones, boosting knowledge creation and sharing, is set.
- The animal health and welfare research community at large benefit from and use an improved comprehensive knowledge framework integrating relevant EU, national/regional data and information infrastructures to improve transnational research.
- Preparedness against upcoming and emerging threats to animal health, including zoonoses and vector-borne diseases, is strengthened for both animals and humans.
- Animal welfare is promoted and strengthened, including adaptation to climate change.
- Farmers, the veterinary profession and other actors in animal production have increased access to innovative methodologies and products for animal infectious diseases and animal welfare monitoring and control.
- Increased evidence-base is provided to animal health and welfare policymakers.

Scope: The partnership should coordinate research programmes and activities on animal health and welfare between the EU and its Member States and Associated Countries and trigger combined action.

It should mobilise key partners and stakeholders, including ministries, funding agencies, research performing organisations, research infrastructures, farmers, industry, etc.

The partnership should address terrestrial livestock and aquatic animals. Wildlife and companion animals will be addressed when there is a potential threat to public health or health of production animals.

The partnership's co-created strategic research and innovation agenda should include calls for research projects, as well as integrative activities. As such, it should boost fundamental research through to applied research, and should give rise to ready-to-use solutions, seek uptake of results and provide science-based policy advisory activities.

Delivering on the partnership's ambitions requires the implementation of the following portfolio of activities to be achieved during the partnership's lifetime:

- To support transnational research and innovation activities, as defined in its Strategic Research and Innovation Agenda (SRIA).
- To facilitate the cooperation between all major actors on the monitoring, prevention and control of animal infectious diseases and on animal welfare issues. Actions will be undertaken to strengthen alignment of research and innovation programs and joint integrative activities among research performing organisations and other actors and stakeholders to organise education and training activities, mobility schemes, networking; to optimise research infrastructures and resources, including networking.
- To boost research and to increase the evidence-base to develop products, indicators and tools for monitoring, control and improvement of animal health and animal welfare from farming to slaughtering, notably through joint research activities organised both among research performing organisations in the partnership and through launching open joint calls.
- To support surveillance, detection, risk assessment and alert communication, prevention, including selective breeding for relevant phenotypes and feeding supporting health and welfare, interventions including vaccines and treatments, socio-economic assessment on animal health and welfare.
- To enhance cross-sector cooperation and collaboration to prevent the spill-over of pathogens between animals, food, the environment and humans in a One Health perspective. The partnership will contribute to a multidisciplinary approach across sectors dealing with animal health and animal welfare, public health, food safety and the environment, including adaptation to climate change, in particular regarding zoonoses and antimicrobial resistance.
- To ensure general and targeted communication on the outputs of the partnership and dissemination of its deliverables to partners, policymakers, national and international stakeholders, and all other possible users, to stimulate their uptake and implementation.

- To regularly update the partnership vision and strategy, in particular to address new needs, for instance emergencies, policy implementation, stakeholders' interests, societal demands.

The Partnership is open to all EU Member States, as well as to countries associated to Horizon Europe. Partners are expected to provide financial and/or in-kind contribution, in line with the level of ambition of the proposed activities. The Partnership should be open to include new partners over its lifetime. Its governance should allow for engaging a broad range of stakeholders, together with the full members of the Partnership.

Guidelines, standards and legislation in the field should be taken into consideration, to facilitate the marketing of the methods and products developed in the partnership.

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties. Financial support provided by the participants to third parties is one of the means of this action to achieve its objectives.

To ensure that all work streams are coherent and complementary, the partnership is expected to foster close cooperation and synergies with the existing European Partnership Biodiversa + and with relevant future European Partnerships, in particular 'agroecology living labs and research infrastructures'¹⁴⁰, 'sustainable food systems for people, planet & climate'¹⁴¹, 'one health AMR'¹⁴² and 'pandemic preparedness'.

The partnership should allocate resources to:

- Cooperate with existing projects, initiatives, platforms, science-policy interfaces, at EU and other levels, where relevant to the partnership's goals;
- Engage with relevant EU bodies in charge of providing scientific advice for policy making in the area of animal health and welfare, such as the European Food Safety Authority and the European Medicines Agency, and other EU bodies, where relevant to the partnership's goals.

To achieve the international cooperation objectives, and given the global dimension, not least of animal health, collaboration with strategic third country partners with proven added value in the field of animal health and welfare is encouraged. In particular, the participation of legal entities from international countries and/or regions including those not automatically eligible for funding, is encouraged in the joint calls and/or in other activities of the partnership. Cooperation with international organisations may be considered.

¹⁴⁰ HORIZON-CL6-2023-FARM2FORK: European partnership on accelerating farming systems transition: agroecology living labs and research infrastructures

¹⁴¹ HORIZON-CL6-2023-FARM2FORK: European partnership on sustainable food systems for people, plant and climate

¹⁴² HORIZON-HLTH-2024-DISEASE-09-01: European Partnership: One Health Anti-Microbial Resistance

Applicants are expected to describe in detail how they would carry out this collaborative work in practice.

Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud should be foreseen, exploiting synergies and complementarities of the different approaches.

This topic should involve the effective contribution of social sciences and humanities disciplines.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

The expected duration of the partnership is seven to ten years.

HORIZON-CL6-2023-FARM2FORK-01-3: Improving yields in organic cropping systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁴³ .
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Expected Outcome: A successful proposal should support the objectives of the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to promote and increase organic farming¹⁴⁴ in Europe, in line with the farm to fork and biodiversity strategies' target of at least 25% of the EU's agricultural land under organic farming by 2030 and a significant uptake of agroecological practices. Activities will support the implementation of specific actions in the action plan for the development of organic production¹⁴⁵. Given the potential of organic farming to contribute to the EU's climate ambition, this topic will contribute to the objective of a climate-neutral land sector by 2035 and a climate-neutral economy by 2050.

Project results are expected to contribute to all of the following expected outcomes:

- Increased and accelerated availability, accessibility and adoption of strategies and approaches that improve yields of crops grown under organic conditions, including organic-targeted plant breeding
- Enhanced climate, environmental and economic performance of organic farming systems
- Increased networking and knowledge exchange among all relevant actors in the Member States and Associated Countries, contributing to a strengthened research and innovation ecosystem of organic production in Europe
- Provision of data, scientific support and recommendations for the development, implementation and evaluation of EU policies and initiatives relevant for organic production

Scope: Promoting the use of more sustainable farming practices is a EU policy objective enshrined in the European Green Deal and its related strategies. Boosting organic farming, one of the objectives of the farm to fork and of the EU biodiversity strategies, can greatly contribute to achieving this ambition. Moreover, the Communication 'Safeguarding food security and reinforcing the resilience of food systems'¹⁴⁶ highlights the role that organic farming can play in reducing EU's dependence on external inputs.

Reaching at least 25% of the EU's agricultural land under organic farming will require among other elements, a significant increase in current conversion rates. One of the obstacles that hinders conversion to organic farming is the fact that several crops grown under organic

¹⁴³ This [decision](#) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

¹⁴⁴ <https://eur-lex.europa.eu/eli/reg/2018/848/oj>

¹⁴⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>

¹⁴⁶ https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

conditions achieve lower yields per hectare as compared with those produced under conventional farming practices. Closing the yield gap is therefore important in order to further improve the economic competitiveness and resilience of the sector, as well as to increase farmers' adoption of organic production

At the same time, closing of the yield gap should not compromise the principles and objectives of organic farming, in particular with regard to the recycling of nutrients. Moreover, it is important that approaches and strategies aiming at bridging the yield gap in organic farming are holistic and take into consideration the implications on the entire farming system.

By using a participatory approach, proposals should set up a European-wide network of testing, experimentation and demonstration sites to test, co-create and showcase practices and strategies that improve yields of crops produced under organic conditions. In this context, proposals should:

- Identify the most relevant crops in organic production for which yields can be sustainably improved in the short term, and propose crop-specific strategies with due attention to local and site-specific practices. This should consider cost-effectiveness analysis comparing with conventional farming production, in order to evaluate the economical sustainability of the strategies proposed.
- Give due attention to holistic approaches, such as those that contribute to improving organic-tailored plant varieties and appropriate use of breeds and varieties, and building soil fertility and optimal nutrient management (e.g., integrated plant-animal production systems, use of manure as fertiliser, nutrient recycling, introduction of crop rotations and intercropping, use of leguminous crops, circular approaches for maintaining and increasing soil organic matter, locally-specific optimization of water use, etc.). Nursery techniques for the production of suitable organic plant reproductive material should also be considered.
- Organise and implement advisory activities, exchange of knowledge and best practices as well as dissemination of results, including the development of practical guidelines and decision-support tools for farmers. These activities should also engage farmers involved in low-input farming, agro-ecological or circular farming, to facilitate cross-fertilisation and mutual learning.
- Identify remaining gaps (including normative gaps where relevant) and prepare a research and innovation roadmap to boost yields of crops produced under organic conditions. For these activities, proposals should ensure collaboration with relevant activities carried out under other actions in Horizon Europe, and ensure coherence with and contribution to the Strategic Research and Innovation Agenda of the future partnership "Accelerating farming systems transition: agro-ecology living labs and research infrastructures" and its successive updates.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders (farmers, breeders, researchers, advisors, industry, etc.). Proposals should cover a representative range of pedo-climatic conditions across Europe and a wide range of crops (arable and perennial) reflecting the diversity of the European organic plant production sector. Proposals should ensure synergies and build on the results from previous and/or ongoing research projects. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, including under the topic HORIZON-CL6-2023-GOVERNANCE: 'Developing an EU advisory network on organic agriculture', HORIZON-CL6-2024-GOVERNANCE: 'Organic farming thematic network to compile and share knowledge ready for practice', and the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures'. In order to better address some or all of the expected outcomes, as well as to promote learning and cross-fertilisation with activities carried out outside of Europe, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-4: Towards research and innovation beyond farm to fork strategy targets for pesticides after 2030

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 1.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 1.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁴⁷ .
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Expected Outcome: The successful proposal should support the implementation of the farm to fork strategy, the EU biodiversity strategy for 2030 and the EU climate policy under the European Green Deal. Activities will contribute to the transition to fair, healthy and environmentally friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides.

Project results are expected to contribute to all of the following expected outcomes:

- Improved understanding of main knowledge gaps as well as of drivers and barriers to go beyond the farm to fork targets for chemical pesticides;
- Increased networking and knowledge exchange across Europe promoting a reduction in pesticide use and risk beyond the farm to fork targets;
- Research needs for further reductions or phasing out chemical pesticides in agriculture are identified.

Scope: The use of chemical pesticides in agriculture harm non-target organisms including humans, contaminates the soil, water and the wider environment, and cause biodiversity decline in agricultural areas. The European Green Deal has set new targets and defined a roadmap to reach its objectives through multiple strategies and action plans, including the farm to fork and the EU biodiversity strategy for 2030. Ambitious targets have been set for agriculture, namely the goal of reducing by 50% the use and risks of chemical pesticides, as well as the use of more hazardous pesticides, by 2030.

Research has shown that well-designed integrated pest management programmes can control weeds and pests in an ecologically friendly manner; however, today's farming still relies significantly on chemical treatments to ensure farm yields and profits. A key challenge is to assess the impact on sustainability (environmental, social, economic) of going beyond these 2030 targets of pesticide reduction aiming for further reductions or even phasing out chemical pesticides in EU agriculture, starting with the most hazardous ones, while sustainably coping with the consequences of climate change, such as heat, drought and extreme precipitation, or pressure from invasive pests and diseases. In order to achieve this, a stronger R&I ecosystem should be put in place that would be able to contribute with sustainable solutions, assess the challenges of further reductions or phasing out chemical pesticides on food systems, including food security and affordability, and connect the different ongoing efforts and initiatives.

Proposals should:

¹⁴⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Establish a network that promotes close cooperation among relevant research and innovation actors (including social sciences) and networks across the EU and Associated Countries;
- Provide a comprehensive analysis and understanding of knowledge gaps and new research paradigms to be addressed towards a sustainable (and beyond farm to fork targets) agriculture;
- Identify, map and foster pesticide use and risk reduction related activities in the EU, Associated Countries and worldwide, including programmes and demonstration facilities, all along the agri-food chain;
- Identify the challenges and opportunities for primary producers and other actors of the agri-food chain to drive the transition towards a sustainable (and beyond farm to fork targets) agriculture;
- Provide recommendations on the future research needs in agricultural sciences, as well as in technical, social, economic and policy sciences, aiming for further reductions or phasing out chemical pesticides in agriculture taking in consideration climate change, increased pressure from pests and diseases, and other challenges.

Proposals should consider arable and perennial crops. Proposals should build and capitalise on the outcomes of other relevant EU-funded research projects and initiatives under Horizon 2020¹⁴⁸, Horizon Europe¹⁴⁹, and other programmes/initiatives (such as COST actions, PRIMA). Activities should ensure alignment and complementarity with those carried out under the future partnership ‘Accelerating farming systems transition: agroecology living labs and research infrastructures’ and the European Mission ‘A Soil Deal for Europe’. Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various sector, researchers, farmers, advisory services, agri-food industries, consumers and NGOs are brought together.

HORIZON-CL6-2023-FARM2FORK-01-5: Advancing vaccine development for African swine fever

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately.

¹⁴⁸ Horizon 2020 projects: SPRINT (Grant agreement ID: 862568), IWM PRAISE (Grant agreement ID: 727321), NOVATERRA (Grant agreement ID: 101000554), WeLaser (Grant agreement ID: 101000256), Bioschamp (Grant agreement ID: 101000651), novIGRain (Grant agreement ID: 101000663)

¹⁴⁹ Projects under the following Horizon Europe topics: HORIZON-CL6-2022-FARM2FORK-01-02: Socio-economics of pesticide use in agriculture, HORIZON-CL6-2023-GOVERNANCE-01-21: Developing EU advisory networks to reduce the use of pesticides, HORIZON-CL6-2022-FARM2FORK-02-01-two-stage: Agroecological approaches for sustainable weed management, HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution.

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: A successful proposal will support research and innovation to help policy makers and economic operators reduce the burden of African swine fever (ASF), thus contributing to a safeguarding animal health and the economic resilience of the sustainable livestock industry.

Activities under this topic will contribute to the following expected outcomes:

- Improved capacity to develop ASF pilot vaccines and their companion DIVA tests for the possible prevention and/or eradication of the disease in domestic pigs and wild boars;
- Vaccination strategies for both wild boar and domestic pigs, addressing different objectives and needs (e.g. eradication in wild boar; emergency or preventive use in domestic pigs).
- Increased international cooperation on a possible ASF vaccine.

Scope: ASF is a devastating viral disease that has showed its potential for very serious and rapid spread, not only in Europe, but throughout the world. It has a serious socio-economic impact on farming sector and is of major importance in the international trade of animals and animal products. While strict control measures including in particular biosecurity, culling of infected pigs, appropriate management of wild-boar populations, have contributed to reduced spread of the disease, concerns are raised on the possibility to eradicate the disease without vaccination in the long-term.

Global research efforts are starting to show some promising results, but further work on the development of effective and safe ASF vaccines is needed, as an additional tool to re-inforce control and eradication strategies currently in place.

All the following elements should be incorporated:

- Address the necessary steps for developing pilot vaccines against ASF for domestic pigs and wild boars;
- Address the necessary steps to develop companion DIVA tests, where feasible.
- Decipher pathogen genetics/genomics and immune response of the host, to develop innovative approaches to African swine fever vaccine development, at least including those virus types circulating in Europe. Study different types of vaccines and modern techniques to develop novel ASF vaccines;

In order to achieve the expected outcomes, international cooperation is encouraged in particular with North America.

The selected project should take into consideration the EU animal health regulatory framework.

Proposals should ensure adequate involvement of stakeholders from the European Medicines Agency, veterinary authorities, farmers and hunters. Involvement of the pharmaceutical industry is highly recommended.

While it is expected that proposals will present innovative approaches to ASF vaccine development, the projects could consider the relevant activities and outputs of past or ongoing EU funded research, such as VACDIVA¹⁵⁰ and DEFEND¹⁵¹, and of other international projects on ASF vaccine and build on them where appropriate. They should contribute to the relevant objectives of the Star-Idaz International Consortium¹⁵².

HORIZON-CL6-2023-FARM2FORK-01-6: Towards sustainable livestock systems: European platform for evidence building and transitioning policy

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

¹⁵⁰ <https://vacdiva.eu/>
¹⁵¹ <https://defend2020.eu/>
¹⁵² <https://www.star-idaz.net/>

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁵³ .
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Expected Outcome: Increasing sustainability, viability and resilience of climate friendly agricultural production are key objectives of the farm to fork strategy. The adoption and enhancement of more biodiversity-friendly farming systems is among the objectives of the EU biodiversity strategy for 2030. In line with these objectives, the successful proposal will support policy makers with science-based evidence on the impacts and externalities of livestock farming as part of the food system and wider ecosystem.

Activities under this topic will contribute to all of the following expected outcomes:

- Assembled collation of comparable and sound data on positive and negative impacts and externalities from the terrestrial livestock sector in accordance with internationally agreed methodology
- Quantitative, qualitative and monetized evidence of the social, economic and environmental impacts and externalities of different livestock production systems (extensive, intensive, organic, different animal species), and their relation to particular food systems (e.g., short supply, circular, market oriented...) as well as trade-offs/synergies assessed at farming and landscape scale
- Recommendations/policy advice on more effective tools in mitigating negative externalities and increasing positive externalities in different terrestrial livestock production systems
- Ensured more intensive and broader communication and dissemination of evidence-based knowledge in the EU and beyond, and make it accessible to all stakeholders groups, citizens and civil society at large.

Scope: The current debate on positive or negative impact and values of animal production is based on abundant contradictory data and on the difficulties in quantifying natural processes linked to agricultural production and land use. Negative and positive impacts and externalities, including potential trade-offs, should be deeply investigated in different types of farming systems, practices and environments. The project will build on a wide range of scientific information, reports, expert opinions and other available material such as databases.

The following elements should be incorporated:

- Provide a comprehensive study on the positive and negative impacts and externalities of terrestrial livestock farming systems in different social, economic and environmental contexts across Europe at farm, landscape and regional levels

¹⁵³ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Mapping of research and innovation projects as well as complementary initiatives, vision papers and reports on impact and externalities of different terrestrial livestock farming systems (extensive, intensive, organic, different animal species) within different food systems
- Develop methods and indicators to measure the scale, range and degree of identified externalities in different livestock systems
- Generate data on the aggregated effects of environmental, social and economic externalities available to allow the assessment of net global impact. Elaborate potential scenarios at national, regional levels through the use of existing or improved modelling
- Improve the understanding of the co-benefit of livestock systems for biodiversity and ecosystem services, land use/change, circularity, GHG emissions/savings, energy consumption, air/water/soil quality, human diet/health, animal health and welfare, food and nutritional security
- Provide new and improved evidence to support decision makers, public authorities, other organizations and stakeholders in the assessment of the socio-economic and environmental impacts and externalities of terrestrial livestock production systems around Europe, building on the specific elements above
- Communicate sciencebased evidence of the impacts of terrestrial livestock systems on climate, environment, biodiversity and ecosystem services as well as potential for improvement towards sustainable livestock systems. The socio-economic dimension should be considered.

In order to better address some or all of the expected outcomes, international cooperation is encouraged. The project will seek to engage a dialogue with and feed into any relevant structure or organization at European level and beyond such as Standing Committee on Agricultural Research (SCAR)¹⁵⁴, FAO, Livestock Environmental Assessment and Performance Partnership (LEAP, FAO)¹⁵⁵, Global Agenda for Sustainable Livestock (GASL)¹⁵⁶, etc.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in terrestrial livestock production systems and their sustainability (e.g., farmers, advisory services, policy makers, producers, land managers, ecology and nature conservation experts, social scientists and other relevant actors).

This topic should involve the effective contribution of Social Sciences and Humanities (SSH) disciplines.

¹⁵⁴ <https://scar-europe.org/>

¹⁵⁵ <https://www.fao.org/partnerships/leap/en/>

¹⁵⁶ <http://www.livestockdialogue.org/en/>

HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal should support the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides by 2030.

Project results are expected to contribute to all of the following expected outcomes:

- Increased availability of widely accessible and cost-efficient alternatives for prevention and (bio)control of plant pest with improved environmental performance (e.g., reduced effects on non-target organisms, natural resources, humans and the environment);
- Reduced reliance on hazardous plant protection products and favour low risk plant protection solutions, to sustain crop productivity and food security while contributing to sustainable agriculture and/or forestry;
- Minimized pesticides impact on human and animal health, terrestrial and aquatic ecosystems, drinking water, soils and the food chain.

Scope: The use of chemical pesticides in agriculture contributes to soil, water and air pollution, biodiversity loss and can harm non-target plants, insects, birds, mammals and amphibians. The Commission is taking action to reduce the overall use and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 50% by 2030. Significant

efforts are required to develop alternatives to critical active substances used in plant protection. Active substances with certain properties defined in Regulation (EC) No 1107/2009 are considered as candidates for substitution¹⁵⁷. For Plant Protection Products (PPPs) containing these active substances, Member States are required, when assessing an application for authorisation, to evaluate if these PPPs can be replaced (substituted) by other adequate solutions (chemical or non-chemical). Proposals should target one or more pesticides candidates for substitution in the EU and those pesticides which have been reported to be losing their efficiency due to the emergence of resistant pests.

Proposals should:

- Develop and test alternative approaches, tools, strategies, agents, and/or substances (either conventional, natural-based, or biological) for prevention (promoting prophylaxis measures) and/or (bio) control of plant pest¹⁵⁸ with improved environmental performance (e.g., reduced effects on non-target organisms, natural resources and the environment) and acceptable efficacy, enlarging the toolbox of integrated pest management (IPM);
- Improve current agronomic, ecological, cultural, and traditional practices to increase the resilience of agricultural production against biotic stresses;
- Assess the social, economic and environmental issues associated with the proposed innovative solution, including trade-offs, the impact on labour, safety culture, and risk management on farms;
- Demonstrate the safety of alternatives in accordance with established scientific risk assessment methodology and relevant EU regulatory frameworks related to their manufacturing and placing on the market.
- Set up demonstration sites in Europe to promote participatory demonstration activities, and the exchange of knowledge and best practices among farmers.
- Support capacity building, training and education enabling farmers/growers to the proposed solution reducing the use and risk of pesticides.

Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various sectors such as researchers, farmers, advisors, and industry including SMEs are brought together.

¹⁵⁷ These are plant protection products containing active substances that meet the cut-off criteria as set out in points 3.6.2. to 3.6.5 and 3.8.2 of Annex II to Regulation (EC) No 1107/2009 or are identified as candidates for substitution in accordance with the criteria in point 4 of that Annex.

¹⁵⁸ A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

Where relevant, proposals should seek complementarities and synergies, while avoiding duplication and overlap, with relevant actions funded under Horizon 2020¹⁵⁹. Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics¹⁶⁰, for example by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

The possible participation of the JRC in the project will consist of supporting the assessment of the social, economic and environmental issues associated with the proposed innovative solution, including trade-offs, the impact on labour, safety culture, and risk management on farms.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Enabling sustainable fisheries and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-8: Using automatic species recognition and artificial intelligence to fight illegal fish discards and revolutionise fisheries control

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal objectives, both the farm to fork strategy and the common fisheries policy aim to ensure that fishing and aquaculture are ecologically, economically and socially sustainable and provide a source of healthy food for EU citizens. The successful proposals should unequivocally contribute to phase out the practice of discarding unwanted fish and improving catch-reporting data by using automatic species recognition and artificial intelligence to analyse data sources, such as video footage,

¹⁵⁹ Projects from topic SFS-04-2020 - Integrated health approaches and alternatives to pesticide use: NOVATERRA (Grant agreement ID: 101000554), WeLaser (Grant agreement ID: 101000256), Bioschamp (Grant agreement ID: 101000651), novIGRain (Grant agreement ID: 101000663)

¹⁶⁰ For example, HORIZON-CL6-2023-GOVERNANCE-01-21: Developing EU advisory networks to reduce the use of pesticides

rapid DNA-based assays and sensor data in real-time through, for example, internet of things or similar monitoring systems.

To ensure that fisheries are ecologically, economically and socially sustainable and provide a source of healthy food, the EU needs to close the possible loopholes in the legislations that could potentially allow for illegal and unsustainable fishing practices. To be successful, the EU needs to have in place a technologically advanced and effective fisheries monitoring and control system and the digitisation of fisheries is a key element (notably through the use of techniques such as artificial intelligence, sensors and robotics). This objective will also contribute to the headline ambition “A Europe fit for the digital age”.

The selected project is expected to contribute to all of the following outcomes:

- Effective methods, tools and systems for species automatic recognition, analysis of Remote Electronic Monitoring video footage, rapid DNA-based assays and sensor data in real-time, and enhanced integration of results into the reporting systems used by fishers to report catches to competent authorities;
- Enhanced capability to monitor and control illegal discarding practices at sea and increased ability by EU Member States to fully implement the Landing Obligation;
- Implementation of ad-hoc sensors for the detection of discards and take advantage of the data from the Copernicus network, namely from its Maritime Surveillance Service;
- Optimal fishing operations and fishing processing and enhanced EU ability to collect, exchange and analyse data;
- Improved monitoring capabilities, including processing activities on board fishing vessels, and ultimately support to a sustainable management of marine biological resources.

Scope: Proposals should develop innovative and cost-effective solutions for automatic species recognition and quantification and assessment of health status of species (e.g., presence of parasites), and automatically analyse Remote Electronic Monitoring video footage, rapid DNA-based assays and sensor data in real-time. They should also develop mechanisms to ensure that the data collected by the cameras and sensors to be automatically analysed cannot be tampered with and that the system can automatically identify cases of system malfunction or missing information. Additionally, proposals should test the suggested solutions in real conditions, including the development of at least three pilot cases in three different European seas. They should also analyse vulnerabilities, dependencies and critical infrastructure in expanding the use of the solutions to Europe and worldwide (e.g., Regional Fisheries Management Organisations and Sustainable Fisheries Partnership Agreements).

Moreover, proposals should investigate possibilities for the integration of the results of the artificial intelligence analyses for the purposes of automated catch recording and reporting recommend effective designs of remote monitoring systems to cover processing activities on board of fishing vessels, and explore the possibilities of the system to contribute to the

identification of parasites in processed fish (e.g. via DNA-based assays). They should also recommend standardised remote electronic monitoring formats for the exchange of the information between different control authorities or to be used for scientific purposes, including standards based on FLUX that could be potentially proposed for recognition by UN/CEFACT.

Also importantly, proposals should analyse how fisheries data, containing private information, can be shared in an anonymized and safe way complying with EU data protection rules (General Data Protection Regulation).

Finally, they should explore and recommend strategies to overcome possible resistance, by all stakeholders/parties, to the implementation of the innovative solutions and propose different ways for effective implementation.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Transforming food systems for health, sustainability and inclusion

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-9: European partnership on sustainable food systems for people, planet and climate

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 45.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 45.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: The funding rate is 30% of the eligible costs. Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the

	primary activities of the action in order to be able to achieve its objectives, the EUR 60 000 EUR threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.
<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR 175 million.

Expected Outcome: Food systems are among the central leverage points for the transition; they are inextricably linked with the well-being of people and planet. This is reflected in the farm to fork and EU biodiversity strategies, which are at the heart of the European Green Deal. They identify ambitious targets and objectives for redesigning parts of the food system, outline actions, and pledge to monitor the progress towards them. The UN Global Food Systems Summit 2021 has addressed these issues globally. A successful proposal will contribute to the European Green Deal priorities, especially to the farm to fork strategy, and will deliver co-benefits on each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowering communities. The Partnership will also contribute to the common agricultural policy / common fisheries policy, circular economy action plan / blue economy, sustainable aquaculture, single market for green products, Europe’s digital decade, 2030 climate target plan, Waste Framework Directive, bioeconomy strategy and action plan, and the EU zero pollution action plan.

The Partnership will coordinate, align, and leverage European and national R&I efforts to future-proof food systems for co-benefits through an integrated and transdisciplinary systems approach. The Partnership will provide the scientific evidence, as well as the collaborative experience among practitioners and citizens, to support the transformation of local, national, European and global food systems.

The partnership is intended to contribute to all the following expected outcomes:

- Accelerated transformation of local, national, European and global food systems, making them safe, sustainable, within planetary boundaries, healthy, fair and trusted – for everyone;
- Sustained multi-stakeholder EU partnership for R&I on food systems transformation with global-to-local linkages and a core strategy on food systems;
- Enabled EU-wide committed food innovation policy and a strong foundation for a European Research Area for food systems;
- Enhanced changes in the way we eat: safe, healthy and sustainable food are standard for all in the diverse food environment, via dietary shifts; changes in the way we process and

supply¹⁶¹ food: supply-side and process innovation towards carbon neutrality, product diversity and circularity, changes in the way we connect with food systems: Citizen engagement and consumer trust in reoriented food systems; and changes in the way we govern food systems: Leverage points for local, national, EU and global transition pathways – incentives, boundary settings and co-creation.

Scope: The future health of Europe’s people and the planet lies on our plate. The way in which food is produced on land, in fresh water and in oceans, as well as in aquaculture systems, fished, processed, packaged, distributed, valued, prepared, consumed, wasted and recycled should change to ensure that environmental, social and economic sustainability of food become core assets of EU’s food systems, along with food safety and food security. Research and Innovation (R&I) is a critical resource for the EU in the transformation towards Sustainable Food Systems¹⁶² for People, Planet & Climate (SFS). The prime condition for success is that a wide diversity of actors join forces in a Partnership – with a mission for change and willingness to contribute to joint actions.

There is consensus about the need for transformation of the current types of production, processing, distribution, and consumption in linear food chains towards circular food systems functioning within planetary boundaries. The sustainable food systems will provide food that is safe, sustainable healthy, fair and trusted for/by everyone. This transition needs an overarching food systems approach to address several challenges in an integrative manner and empowering all relevant stakeholders, diverse voices and geographical regions. This partnership does not address primary production as growing food, agricultural production and other specific aspects related to it, will be covered in the Horizon Europe Partnerships on Agroecology and Animal Health and Welfare.

This Partnership will provide a food systems R&I platform connecting local, national and European platforms, R&I programs and combining in-cash and in-kind resources in support of the transition to sustainable European food systems by 2030.

The European Partnership under Horizon Europe Sustainable Food Systems for People, Planet & Climate should be implemented through a joint programme of activities. These should target high impact, relevance for stakeholders and capacity building, ranging from research, innovation to coordination and networking activities, including training, dialogue, communication and dissemination activities in all research and innovation projects of the Partnership. Emphasis should be given to demonstration, upscaling and experimentation calls that strengthen collective intelligence and effect meaningful transformations through informing all of the stakeholders on the best science, data and insights from across the food systems:

The Partnership should aim to achieve the following objectives:

¹⁶¹ Food supply does not refer to agricultural production, but to food processing, extraction and combination of ingredients, and food preparation (such as by the catering and restaurant industry).

¹⁶² IPES-Food (2017). Unravelling the Food–Health Nexus: Addressing practices, political economy, and power relations to build healthier food systems. The Global Alliance for the Future of Food and IPES-Food. Available at: <http://www.ipes-food.org/reports/>

- Develop work programmes as implementation steps of the high-level Strategic Research and Innovation Agenda (SRIA) defining key activities;
- Pool R&I resources by joint calls for R&I projects based on commonly developed Strategic Research and Innovation Agenda (SRIA) and a Roadmap;
- Establish a Food systems knowledge Hub of hubs with a central Hub (or Platform) for understanding when food systems are evolving sustainably (in what contexts, with which actors, etc.), and a network of transformative research and innovation labs (FS-labs or ‘hubs’) for systemic innovations at different scales;
- Provide place-based solutions in the FS Labs, exploring them as living labs to test sustainable food systems pathways, like policy and city labs, experimental restaurant environments, etc.;
- Provide the frame for developing system approaches with sustainable outcomes in the Hub of hubs;
- Enable knowledge sharing, and scaling - adapting knowledge systems, innovation platforms and science-policy interfaces for ensuring impact; while making use of data and technology where it adds value. The science based collective intelligence will effect meaningful transformation. Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.

When it comes to food systems, it is important to recognize that all food producers, including aquaculture and fisheries, as well as retailers and processors have a key role as intermediaries between production and consumption. Alignment of private and public goals is a condition for success of public strategies. In particular, innovative food businesses implementing the European Green Deal, farm to fork and bioeconomy objectives could play a lighthouse role. Stakeholders from the quadruple helix¹⁶³ (i.e. policymakers, businesses/industry, researchers, and civil society), from different sectors of the food system, should be brought together on this overarching platform, with the aim of strengthening science-policy-society interfaces and increase transformative potential.

Partners are expected to provide financial and/or in-kind contributions for the governance structure, the joint calls and other dedicated implementation actions and efforts for national coordination. The partnership is expected to mobilise EU, national and regional capacities to leverage investments, including from the private sector and foundations, increase up-scalability and market accessibility for the developed solutions and thus increase the return to investments.

¹⁶³ <https://op.europa.eu/en/publication-detail/-/publication/6e54c161-36a9-11e6-a825-01aa75ed71a1>

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The Partnership is part of a “partnership landscape” that needs to avoid overlaps and build synergies for win-win collaboration and solutions, in particular with the Partnerships Accelerating farming systems transition: agroecology living labs and research infrastructures, Agriculture of Data and Animal Health and Welfare. Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The Partnership should allocate resources to cooperate with existing projects, initiatives, platforms, science-policy interfaces, institutional processes at EU level, and at other levels where relevant to the partnership’s goals. Proposals should pool the necessary financial resources from participating national (or regional) research programmes with a view to implementing coordinated calls for transnational proposals that provide grants to third parties.

This topic should involve contributions from the social sciences and humanities disciplines.

The expected duration of the partnership is seven to ten years.

The Commission envisages to include new actions in its future work programmes to provide continued support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2023-FARM2FORK-01-10: Eradicate micronutrient deficiencies in the EU

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 9.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food systems, and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to eradicate micronutrient deficiencies in the EU and Associated Countries. It will contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

The main objective of this topic is to contribute to the eradication of micronutrient deficiencies and reduction of nutrition inequalities across EU and Associated Countries at different levels (e.g. countries, regions, urban/rural/coastal areas) and for different communities of vulnerable groups such as infants, elderly, pregnant women, people with food intolerances/allergies, people with metabolic disorders on the one hand, and migrants and low income groups on the other hand.

Project results are expected to contribute to all of the following outcomes:

- Improved knowledge of the true prevalence of human micronutrient deficiencies across EU and Associated Countries and development of proposals for optimal interventions to eradicate micronutrient deficiencies in different target groups;
- Improved knowledge and understanding of micronutrient functionality and metabolism during food digestion at different critical periods of life;
- Reduction of nutrition inequalities by providing solutions at a general population level across EU and Associated Countries;
- Eradication of micronutrient deficiencies by providing solutions particularly for the vulnerable population groups in shifting towards healthier diet;
- Better understanding of the health costs resulting from micronutrient deficiency.

Scope: Globally, more than 820 million people have insufficient food intake and many more consume low quality diets that cause 2 billion of people with micronutrient deficiencies and 2 billion of people overweight or obese. Micronutrient deficiencies have a direct impact on individuals and on societies, resulting in poorer health, lower educational attainment and decreased capacity to work and earning potential. The elderly, pregnant woman, children, people with chronic disease and poorer population groups or people socially isolated are particularly at risk. Even if modern food distribution has largely eliminated seasonal gaps in fruits and vegetables, only a limited number of edible crops (2 %) are currently used for the human diet. Therefore, it is still possible that individual diets are not varied enough to ensure adequate dietary quality and prevent micronutrient deficiencies. Climate change and increased atmospheric CO₂ can directly alter (micro) nutrient content of crops and livestock products. Processing also alters the nutrient composition of foods (e.g. by removal of the part of the grain that contain beneficial nutrients such as fibre, protein and micronutrients) and, potentially, nutrient bioavailability (e.g. change of structure with treatment with high

pressure/temperature). In Europe, studies suggest substantial variability in micronutrient intakes such as vitamins D and E, iron, iodine, magnesium, potassium, selenium and zinc according to sex and among different population groups and countries.

Micronutrient deficiencies are preventable and the choice of interventions should be based on the root cause, the scope and severity of the micronutrient deficiencies. Proposals for interventions/solutions need to be coherent with national/Associated Countries and EU food and health laws and policies. Where relevant, activities should build on and expand the results of past and ongoing research projects and collaborate with relevant initiatives.

Standardized methods should be used for collecting missing data and/or for updating them using existing data/studies/cohorts to generate better quality data on population micronutrient statuses to plan and target proposals for policy makers to develop intervention programs and propose them mechanisms to monitor their progress.

Proposals are expected to address all of the following R&I activities:

- Develop specific micronutrient biomarkers to facilitate screening of high-risk populations/individuals and to identify the optimal intervention.
- Map and monitor the specific vulnerable groups suffering from micronutrient deficiencies at national/regional/rural/urban/coastal levels for different gender, age, socio-economic and cultural groups in EU and Associated Countries to determine the root cause and the true prevalence of the micronutrient deficiencies, identify their specific needs for optimal health/development.
- Explore the determinants and barriers of micronutrient deficiencies in different geographical zones. Utilize big data and artificial intelligence to elucidate the complex links between micronutrients, diets, health and development of diseases.
- Further study the functionality, bioavailability, risk/benefits of the micronutrients during critical periods of life. Understand the specific mechanism of food digestion (e.g. the effect of the matrix, role of the gut microbiome, interaction with other ingredients/nutrients) to enable to advise for optimal combinations of foods to maximise bioavailability, or to incorporate, where appropriate, micronutrients in food products in order to be taken efficiently.
- For the vulnerable groups, develop innovative solutions/strategies/programme, through an integrated food-based approach instead of food supplementation and fortification (e.g. fresh and diversified food naturally rich in (micro)nutrients of concern which are under-consumed including old/neglected fruit and vegetable crops) for different geographical zones and for different communities and evaluate their effective impact on micronutrients deficiencies.
- Develop innovative and effective tools to improve education, communication and training on healthy nutrition and diets in order to avoid micronutrient deficiencies which are adapted to various socio-economic groups of the populations in respect of cultures,

ages, gender, needs at different level (e.g. public authorities, health care providers, education systems). These tools should be available to policy makers, responsible national authorities to support their efforts for health promotion, disease prevention and care.

- Provide recommendations, guidelines and cases studies underpinned by scientific evidence that are coherent with relevant national and EU food law and policy and that could be used by policy makers to design coherent, safe and sustainable micronutrient deficiency programmes. Provide evidence in the form of a cost/benefit analysis of the proposed measures and the costs of not acting.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain and take into account sex and gender analysis. Relevant advice of European Food Safety Authority (EFSA) has to be taken into account.

HORIZON-CL6-2023-FARM2FORK-01-11: New detection methods on products derived from new genomic techniques for traceability, transparency and innovation in the food system

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal will be in line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. The farm to fork strategy aims to accelerate the transition to sustainable farming and food systems. It recognises the role that new innovative techniques may play in increasing sustainability, provided they are safe for consumers and the environment while bringing benefits for society as a whole. In addition, one of the strategy's main priorities is to ensure traceability and

authenticity, and to enhance transparency. In this context, the successful proposals should contribute to ensuring traceability and authenticity, enhancing transparency and promoting innovation in the area of new genomic techniques.

Although existing detection methods may be able to detect even small alterations in the genome, this is sometimes not sufficient to confirm the presence of a genetically modified organism/product (GMO) regulated under Directive 2001/18/CE or Regulation 1829/2003, as the same alteration(s) could have been obtained by conventional breeding, which is not subject to the GMO legislation.

The existing approaches for the detection of GMOs cannot be applied in all cases. Various products obtained with new genomic techniques, as defined by European Commission, Joint Research Centre 2021¹⁶⁴, do not contain targets (e.g., promoters/terminators for screening purposes or event-specific sequences) on which GMO detection is largely based.

The challenge to identify certain genetically modified products is not always related to the available methodologies, but rather to the difficulty to differentiate against non-regulated products.

Some of the above mentioned challenges have been identified by recent literature¹⁶⁵ and the European Network of GMO Laboratories (ENGL) report of 26 March 2019 (JRC116289) which, referring to gene editing derived plant products, concluded that validation of an event-specific detection method and its implementation for market control will be feasible only for products carrying a known DNA alteration that has been shown to be unique-(i.e. the alteration should be specific for the gene edited organism/product). The same consideration might apply for cisgenesis applications combined with gene editing. Under the current circumstances, market control will fail to detect unknown genome-edited plant products. The report notes that several issues regarding the detection, identification and quantification of genome-edited products will require further consideration, as its findings are currently based on theoretical assessments.

Project results are expected to contribute to all of the following expected outcomes:

- Reliable detection methods to address the challenges described;
- Development and validation of detection tools for enforcement authorities as well as for developers and agri-food operators;
- Empower enforcement authorities, developers and agri-food operators for the authenticity and traceability of products obtained through new genomic techniques;

¹⁶⁴ New genomic techniques : state-of-the-art review 2021, <https://data.europa.eu/doi/10.2760/710056>

¹⁶⁵ Genome-Edited Plants: Opportunities and Challenges for an Anticipatory Detection and Identification Framework. 2021. Alexandra Ribarits, Michael Eckerstorfer, Samson Simon and Walter Stepanek. *Foods* 2021, 10(2), 430; <https://doi.org/10.3390/foods10020430>; Detection of genome edits in plants—from editing to seed. 2021. Raymond D. Shillito, Sherry Whitt, Margit Ross, Farhad Ghavami, David De Vleeschauwer, Katelijn D'Halluin, Annelies Van Hoecke, Frank Meulewaeter. *In Vitro Cellular & Developmental Biology - Plant* 57:595–608. <https://doi.org/10.1007/s11627-021-10214-z>

- Enable informed consumer choices by enhancing transparency and traceability across the food chain;
- Enable innovation in the food system linked to new genomic techniques.

Scope: Proposals are expected to contribute to the development and validation of detection methods of products obtained through new genomic techniques, including all of the following activities:

- Examine innovative ways and/or specific markers that would allow for distinction between products resulting from new genomic techniques subject to the GMO legislation and products that are not subject to the GMO legislation. This should not only entail the detection of specific mutations, but also of other markers in the genome that are specific for the genotype containing the mutation/s. The methods should be able to distinguish between identical mutations obtained through different techniques;
- Development and validation of reliable detection methods including when possible quantification. Such methods could focus on products with known mutations (i.e. DNA sequence known) or on products with unknown mutations;
- The proposed detection methods should focus on a wide applicability of all or a subgroup of products, allowing for a screening approach. These methods should be assessed on pure products as well as on mixtures typical of food or feed products in the market. Proposals should always include plant-based products and may include also animal and/or microorganisms-based products.
- The proposal could also focus on the detection of unintended mutations or insertions (foreign DNA, CRISPR-Cas sequences, etc);
- The proposals could also include digital/virtual/AI modelling aspects along with the detection methods alternatives;
- The development and validation of standardized methodologies and the contribution to future standardisation processes is encouraged.

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. Proposals could also foresee the involvement of the European Network of GMO Laboratories (ENGL).

Activities are expected to achieve TRL 4-5 by the end of the project. Proposals should define clearly the TRL starting point for each involved technology and the plan to reach more advanced TRL.

Applicants should seek synergies and capitalise on the results of past and ongoing research projects (including projects under the same topic) in the areas of food and feed chain traceability and new genomic techniques. Therefore proposals should include a dedicated

task, appropriate resources and a plan on how they will collaborate with other projects funded under e.g. the topic HORIZON-CL6-2021-ZEROPOLLUTION-01-08. In order to achieve the expected outcomes, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-12: Thematic network ensuring food safety by translating research and innovation into practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁶⁶ .

Expected Outcome: In line with the farm to fork strategy the successful proposals will support food safety in the food system. Despite the continued generation of new knowledge and innovative solutions through funded European projects on how to ensure food safety in the food supply chain, they are often insufficiently exploited/known and widely applied by end-users for different reasons (official control authorities, food business operators, food safety risks assessors, etc.). Innovative ideas from practice are also insufficiently captured, exchanged and spread. Food safety knowledge and innovation ecosystems are insufficiently connected.

¹⁶⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Project results are expected to contribute to all of the following expected outcomes:

- Widespread use of existing new knowledge and innovative solutions by end-users (practitioners) on the ground ensuring food safety;
- Improved flow of knowledge and innovative solutions with end-users through more dynamic interactions and new collaboration methodologies to ensure food safety along the food supply chain;
- Better incorporation of end-users needs into the activities of research and innovation ecosystems, which would generate a better targeted and shared research agenda for innovation-driven food safety research, including the multi-actor approach. Greater user acceptance and adoption of the collected solutions generated;
- Improved skills and long-term availability of training and education material and on-line communities for end-users on how to ensure food safety

Scope: Proposals are expected to contribute to the creation of a thematic network in the area of food safety, including all of the following activities:

- Development of a community of practice to foster knowledge exchange between end-users and research and innovation ecosystems who will work together. Traditional and local food products should be taken into consideration in this community of practice;
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia and research-technology organizations, etc. with end-users (official control authorities, food businesses, industrial clusters, etc.) and other relevant actors of the food chain;
- Compilation of a comprehensive description of the state of food and feed safety practices, procedures, systems and technologies (including not only technologies for food safety hazards detection but also preventative approaches as well as food equipment/systems hygienic design best practices, and existing big data and/or artificial intelligence tools applied to food safety). Proposals should focus on the cost/benefit aspects of the practices and innovations collected and build on existing and new available knowledge, data and models enabling the practical implementation of solutions;
- Creation of tailor-made communication materials summarizing, sharing and presenting, in a language easily understandable for end-users, existing best practices and innovations that are close to implementation into practice, but not sufficiently known by end-users;
- Identification and mapping of possible relations and synergies with other networks, projects, initiatives and policy and funding instruments at regional, national and European level, that could help disseminate and exploit knowledge and results showing the added value of these inter-connections as well as to put in place mechanisms ensuring the future sustainability of the community of practice. Dissemination via public

events, publication of case studies, dissemination papers and reports, and the creation of an on-line collaborative space that remain active in the long-term including the availability of materials for training and education;

- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under the topics HORIZON-CL6-2021-FARM2FORK-01-07, HORIZON-CL6-2021-FARM2FORK-01-16 and HORIZON-CL6-2021-FARM2FORK-01-17.
- Proposals should run for minimum 3 years.

HORIZON-CL6-2023-FARM2FORK-01-13: Cultured meat and cultured seafood – state of play and future prospects in the EU

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposal should also coordinate potential overlapping or complementary work with the European Food Safety Authority (EFSA).

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, the biodiversity strategy for 2030 and the EU’s climate ambition for 2030 and 2050, the successful proposal will support R&I to promote the production, provision and safe consumption of alternative sources of protein, and dietary shifts towards sustainable healthy nutrition, contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable healthy nutrition and safe food, food poverty reduction, empowerment of communities, and thriving businesses.

Cell-based agriculture, and especially cultured meat (also called in vitro meat, lab-grown meat, artificial meat, cellular meat or cell-based meat) and cultured seafood, could be considered as a promising and innovative solution to help achieving the objectives of the farm to fork strategy for fair, safe, healthy and environmentally-friendly food systems. However, the potential environmental impact and impact on sustainability aspects need to be thoroughly assessed and safety established.

As such, the objective of this topic is to develop knowledge on the sustainability aspects relevant to this subject (i.e. environmental, economic, and social). It does not aim to help developing the market of cultured meat and cultured seafood in the EU.

Project results are expected to contribute to all of the following expected outcomes:

- Full understanding and up-to-date knowledge provided to food system actors on environmental, economic and social aspects of cultured meat and cultured seafood, including on ethics.
- Additional knowledge provided on potential challenges of and opportunities offered by cultured meat and cultured seafood to reduce greenhouse gas (GHG) emissions, air, water and soil pollution, resource depletion and impact on ecosystems, generation of wastes, and on human health.

Contribution to the farm to fork objectives and Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: In 2020, cultured meat and cultured seafood knew a boost in interest outside Europe, with the first authorisation for marketing cultivated meat products in Singapore and a large increase in investment. In Europe, this sector is starting to attract investments as well (the EU invested through REACT-EU in lab-grown meat¹⁶⁷). At present, cell-based food products are not marketed in the EU. Such products require a pre-market authorisation before they can be placed on the EU market and, depending on the techniques used, this authorisation may need to be via either the GMO legislation or the novel food regulation. Once an application for the authorisation of these products is submitted to the Commission, the European Food Safety Authority (EFSA) will carry out the safety evaluation of these products, including whether they are nutritionally disadvantageous.

Few studies have been developed to understand the impact of the cultured meat cycle (production, consumption, waste) on the environment, and its link to social and cultural aspects. Rough estimates based on a life cycle assessment suggest lower GHG emissions, land requirements and water use compared to conventional meat. Conclusions on energy use depend on the methodology used and assumptions made. Cultured meat and cultured seafood also face social and cultural challenges.

Proposals are expected to address the following:

- Study the social aspects related to cultured meat and cultured seafood (potential benefits and risks): including the consumers' perception on cultured meat and cultured seafood, animal welfare, religious and ethical aspects, health aspects (for example impacts on obesity or NCDs, nutrition aspects) beyond safety risks eventually assessed by EFSA, etc.

¹⁶⁷ <https://www.independent.co.uk/news/science/beef-culture-grown-eu-lab-sustainable-b1942580.html>.

- Study the economic aspects (potential benefits and risks): including how to reduce the high infrastructure costs and high-cost raw materials, as well as scaling up in a cost-effective way (including through reaching out to start-ups in this field to understand the difficulties and potential); and the “cost of inaction” (economic impact of not having such investments in the EU and Associated Countries).
- Study the environmental aspects (potential benefits and risks) considering the entire life cycle by using the Environmental Footprint methods, including elements on carbon footprint, pollution, impacts on biodiversity, resource use, and considerations on how the released land from livestock production could be utilised within the bioeconomy system, etc. and develop a comparison of the overall environmental impact of cultured meat/seafood vs. conventional meat/seafood. Particular attention should be given to the assessment of the energy intensiveness of cultured meat and cultured seafood production. Livestock co-products, such as leather, pet food, cosmetics, fertilisers, other chemicals, etc., should also be considered, as well as food waste and packaging issues.
- Study technical problems relating to the production of cultured meat and cultured seafood and identify possible solutions that could improve the economic viability, circularity and overall sustainability.
- Identify new sources of ingredients for the cultured meat and cultured seafood to increase the sustainability aspects of the products (including the nutritional value).
- Identify, explore and study scenarios of market penetration and consumer acceptance of cultured meat and cultured seafood and conduct LCA analysis to assess the environmental and sustainability impact/benefits each scenario would result in (considering issues such as the availability of energy for different levels of uptake of this technology).
- Explore the current and possible future impacts for the farmers (including aqua-farmers) and industry, including economic viability, challenges and opportunities for the farming sectors, etc.
- Proposals should involve a multi-disciplinary consortium of independent researchers that should organize conferences and meetings gathering a wide range of food system actors. International cooperation is strongly encouraged. Where relevant, activities should build and expand on the results of past and ongoing research projects (e.g., [Meat4all](#), [CCMeat](#)). The proposals should also consider projects selected under HORIZON-CL6-2021-FARM2FORK-01-12 and HORIZON-CL6-2022-FARM2FORK-01-07. The project should have a clear plan as to how it will collaborate with any other relevant project funded under other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, and common communication and dissemination activities, and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2023-FARM2FORK-01-14: Providing marketing solutions to prevent and reduce the food waste related to marketing standards

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁶⁸ .

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environmentally friendly food system, and the EU's climate ambition for 2030 and 2050, and the Commission communication “Safeguarding food security and reinforcing the resilience of food systems”, the successful proposals will support R&I to prevent and reduce food losses and waste¹⁶⁹. They should therefore contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation),

¹⁶⁸ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

¹⁶⁹ Definition of food waste included in the [Waste Framework Directive](#): *Food waste means all food as defined in Article 2 of Regulation (EC) No 178/2002 of the European Parliament and of the Council that has become waste. Food waste does not include losses at stages of the food supply chain where certain products have not yet become food as defined in Article 2 of Regulation (EC) No 178/2002, such as edible plants which have not been harvested. Such products would be considered food losses. In addition, food waste does not include by-products from the production of food that fulfil the criteria set out in Article 5(1) of Directive 2008/98/EC, since such by-products are not waste.*

biodiversity, environmental sustainability and circularity, sustainable food consumption, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all the following outcomes:

- Better understanding of the impact of food marketing standards on the generation of food waste along the supply chain¹⁷⁰, including the food waste generated between stages of the supply chain, and for various commodities.
- Improved market access to foods that do not meet marketing standards but are still safe to eat.
- Better understanding of the purpose and nature of private marketing standards and the underlying reasons for establishing such standards.

Contribution to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Food marketing standards are standards individuals and businesses comply with to be able to put food on the market or to sell to a particular buyer. These standards include or may include requirements about technical definitions, classification, presentation, marking and labelling, packaging, production method, conservation, storage, transport related administrative documents, certifications and time limits, restriction of use and disposal, ...

As these standards focus on quality, they are different from food safety standards (foods that do not comply with marketing standards can still be safe to eat).

The marketing standards applied to food marketed in the EU exist at different levels and in different forms:

- International standards¹⁷¹.
- EU marketing standards, contained in the Common Market Organisation (CMO) Regulation, the CMO secondary legislation and the “Breakfast Directives”.
- National marketing standards set up by governments of Member States
- Private marketing standards.

Proposals should address all the following points:

¹⁷⁰ The Commission Delegated Decision (EU) 2019/1597 establishing a common EU methodology to measure food waste outlines the following stages of the food supply chain: primary production; processing and manufacturing; retail and other distribution of food; restaurants and food services and households. https://eur-lex.europa.eu/eli/dec_del/2019/1597/oj

¹⁷¹ E.g. the United Nations Economic Commission for Europe (UNECE) standards, the Codex Alimentarius standards, or international guidelines such as the Organization for Economic Cooperation and Development (OECD) schemes. These standards serve or may serve as a basis for standards adopted at EU or national level or for private standards.

- Provide estimates of the amounts of food waste resulting from the application of the above-mentioned marketing standards along the food supply chain. In particular, estimates of the amounts of food waste due to interactions between the stages and actors of the value chain should be provided. These estimates should be differentiated according to the responsible marketing standard(s).
- Assess trade-offs between food waste prevention/reduction objectives and other objectives pursued by marketing standards (e.g. keeping food of unsatisfactory quality off the market, providing clarity and transparency on the market, facilitating the functioning of the internal market; responding to consumers' and society's expectations).
- Assess the underlying reasons for setting up private marketing standards, including aspects related to consumers expectations.
- Identify solutions that would enable to improve the business potential for suboptimal foods not meeting market standards yet still safe to eat. This should include the identification of alternative marketing channels or models (including processing and other destinations), whilst ensuring the highest possible value for their valorisation and considering trade-offs between the different valorisation options. The most promising interventions and good practices already in place for similar foods or food categories should be considered.
- Provide recommendations/solutions to food businesses, owners of marketing standards and regulators on how to prevent/reduce food waste due to marketing standards.
- Some recommendations may help design marketing standards or support future policy development, in order to prevent and reduce food waste.
- Implement the multi-actor approach (see eligibility conditions) by conducting inter- and trans-disciplinary research and involving a wide range of food system actors.

The proposal activities should be performed at least for fruits and vegetables. Applicants may choose to cover additional commodities from the following food types: cereals, fish, meat, dairy and eggs.

The proposal activities should be performed across several Member States, in different parts of the EU.

Proposals should build on past or ongoing research projects and ensure synergy with relevant initiatives, including the Commission's EU Platform on Food Losses and Food Waste¹⁷² and the evaluations already carried out by the European Commission in view of the revision of EU marketing standards and date marking rules. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and any other relevant topic, e.g. by participating in joint activities,

¹⁷² https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en

workshops, etc. Selected proposals under this topic will thus need to work together and adapt their initial work plan. Communication and dissemination activities should also be grouped and coordinated in a complementary manner.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

This topic requires the effective contribution of SSH.

HORIZON-CL6-2023-FARM2FORK-01-15: Fostering resilient European food systems in a changing world

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 8.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the recent communication on “Safeguarding food security and reinforcing the resilience of food systems”¹⁷³ and the farm to fork strategy, the successful proposal will support the implementation of the communication “Contingency plan for ensuring food supply and food security in times of crisis”,¹⁷⁴ thereby enhancing the resilience of European Union food systems in a changing world, as well as taking into account developments on the farm to fork strategy’s proposal for a legislative framework for sustainable food systems.

Project results are expected to contribute to all of the following expected outcomes:

- Better understanding of the short- and long-term drivers of change that may affect food systems at different levels (global, national, regional, urban/rural areas level) and put food security at risk.

¹⁷³ https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf
¹⁷⁴ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12770-EU-food-supply-and-food-security-contingency-plan_en.

- Better understanding of the vulnerabilities, dependencies and critical infrastructures of the food systems in the EU and worldwide, where this may have implications for the EU and Associated Countries.
- Improved preparedness to deal with risks that may threaten the nutritionally appropriate EU and Associated Countries' food supply and food security by making use of available data and platforms (including on weather, climate, biodiversity, socio-economic and markets data).
- Enhanced resilience of nutritionally appropriate food supply and improved food security in the EU and Associated Countries, in a changing world.
- Contribution to the farm to fork objectives and Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: Food is necessary to sustain life. Ensuring food supply is an objective set out in Article 39 of the Treaty on the Functioning of the European Union. The food systems in the European Union have been reliable and supplied more food than demanded. They proved to be resilient to large-scale disruption caused by the COVID-19 pandemic. However, the surge in global commodity prices, further accelerated by Russia's invasion of Ukraine, highlights again the need for EU agriculture, fisheries, aquaculture and food supply chains to become more resilient and sustainable. In an increasingly complex and uncertain world, which is already experiencing unprecedented environmental and climate changes, and in which the state of global geopolitical tensions is high, sustaining the ability of food systems to provide enough food for all that is as nutritious and meets dietary needs is likely to be a substantial challenge for Europe in the future.

Understanding what drives our food system, both externally and internally, on a short-term basis and in the long-term, and how we can measure or monitor the drivers of change and their impacts on the food supply and food security is vital if we want to give policymakers and businesses better tools for making food systems more sustainable and more resilient to diverse shocks and stresses (such as pandemics, geopolitical disruptions, conflicts and economic sanctions, extreme climatic conditions, environmental changes, natural disasters or energy price increase). The project should not only point to some serious vulnerabilities, (inter)dependencies and critical infrastructure of the food systems, but also offer indications for policymakers and businesses about where to direct efforts and investments to improve resilience.

Proposed activities should cover all of the following aspects:

- Analyse vulnerabilities, (inter)dependencies and critical infrastructure of the EU and Associated Countries' food systems in the global context.

- Establish an observatory for the main socio-economic, political, health, technological and environmental drivers of change, including short-term shocks and long-term stresses, to which the food systems were/are/might be exposed and develop an early warning system. For long-term developments, use of foresight is encouraged.
- Advance and/or develop innovative methods/models/tools, including exploratory modelling and capacity for managing deep uncertainties, to identify/evaluate/manage potential risks and improve risk scenario building for EU and Associated Countries' food security.
- Map and prioritize the risks that the different drivers of change pose to the food systems.
- Scan and benchmark what is already being done by government, civil society, and the private sector to reduce the risks and improve the capacity to deal with the various drivers of change.
- Develop innovative solutions and evidence-based recommendations for strategies and best practices on what policymakers, businesses, civil society, scientists, teachers, and other environmental and food system operators (can) do through policy, research, education, community action, or other means to enhance substantially the resilience of the food systems, and thereby ensure food security.
- Explore and mobilize the potential of new technologies, (integrated) information and communications technology (ICT) solutions and big data in improving preparedness for food security crises and the flow of information during crises.
- Establish a regular dialogue with the European Commission and the European Food Security Crisis preparedness and response Mechanism (EFSCM) with the goal to provide relevant contributions supporting the implementation of the communication "Contingency plan for ensuring food supply and food security in times of crisis".

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC) and its Data-Modelling platform of resource economics.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of public authorities and civil society organisations, consumers, the private sector and other relevant actors of the value chain.

This topic should build on the knowledge provided by the assessment reports established by IPCC (Intergovernmental Panel on Climate Change), IPBES (Intergovernmental science Policy Platform on Biodiversity and Ecosystem Services) and IRP (International Resource Panel).

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other relevant projects and existing research infrastructures, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe.

Collaboration and complementarity with the European Partnership on “Sustainable Food Systems for People, Plant and Climate” is encouraged. This topic should involve the effective contribution of SSH disciplines. In order to achieve the expected outcomes, international cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK-01-16: Microbiomes fighting food waste through applicable solutions in food processing, packaging and shelf life

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal should be in line with the European Green Deal priorities, the farm to fork strategy and Food 2030 priorities¹⁷⁵ for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support innovation to foster advances related to microorganisms for safer, healthier and more environmentally friendly food, thus reducing food waste. This is in addition to contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all of the following expected outcomes:

¹⁷⁵ https://ec.europa.eu/info/publications/food-2030-pathways-action-research-and-innovation-policy-driver-sustainable-healthy-and-inclusive-food-systems-all_en

- Applicable innovative and/or business solutions in food processing and packaging and targeting spoilage and/or pathogenic microorganisms in perishable foods to extend shelf life and address food loss and waste.
- Significant measurable improvements in development of microbial preservatives for the food industry as an alternative to chemical ones. Develop an evidence based robust and responsive policy framework for microbiome control in the food system.
- Clearly explain how the proposal will deliver co-benefits to each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Proposals should aim for a holistic approach to realize the full potential that microbiome innovation has in terms of addressing food, health, environmental challenges and related economic problems and opportunities, to extend food shelf life and provide sustainable solutions in food processing and packaging.

Proposals are expected to address all the following:

- Develop microbial indicators of unexpected contaminants or environmental changes in food (e.g., during processing and packaging) and exploring possible microbial-based pathways to prevent food spoilage and reduce food loss and waste.
- Develop applicable microbiome business solutions for food packaging aiming to reduce/control/limit spoilage microorganisms in perishable foods to extend shelf life
- Develop, test and evaluate approaches that combine (meta)genomic or alternative microbiome indicator data in an inter- and transdisciplinary approach, to dynamically predict shelf life.
- Develop models and tools for controlling and predicting shelf life and risk of foodborne infection for improved decision making
- Demonstrate the safety of the developed approach, in accordance with relevant EU regulatory frameworks, related to its placing on the market.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, small-medium enterprises (including start-ups), food businesses and other relevant actors of the value chain.

In order to achieve expected outcomes international cooperation is strongly encouraged, in particular in the framework of the International Bioeconomy Forum.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, as well as organise common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Targeted international cooperation

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-FARM2FORK-01-17: EU-African Union cooperation – linking the activities of the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership and those of the Pan-African Network for Economic Analysis of Policies (PANAP)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If eligible for funding, legal entities established in all African Union Member States* may exceptionally participate in this Coordination and support action as a beneficiary or affiliated entity. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding.* "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p> <p>The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least five independent legal entities established in Africa.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<i>Legal and financial set-up of the Grant</i>	The rules are described in General Annex G. The following exceptions apply:

<i>Agreements</i>	Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁷⁶ .
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Expected Outcome: In line with the European Green Deal priorities and in particular the farm to fork strategy, and in support of the African Free Trade Area, the successful proposal will contribute to the African Union (AU)-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved alignment of activities of the FNSSA Research and Innovation Partnership and of the Pan-African Network for Economic Analysis of Policies (PANAP) in the scope of EU-AU cooperation, supporting the implementation of the FNSSA 10-year roadmap and the global transition towards sustainable food systems, providing end users with co-benefits in terms of evidence-based policy analysis supporting food and nutrition security and sustainable agriculture.
- Provide opportunities for exchange in sustainable agricultural and food system policy development and related studies between EU and AU in the context of the EU-AU FNSSA Research and Innovation Partnership and in the framework of PANAP.
- Support African agricultural and food systems policy making process through enhanced cooperation in the area of economic, social and environmental impact (including biodiversity) analysis of policy options for food systems, nutrition performance, agri-food trade, and development of rural areas.
- Fill in the gap between researchers and decision-makers, by fostering dialogues to better understand the duties and responsibilities of stakeholders.

Scope: Proposals should address the following:

- Reinforcing capacity building on policy definition and impact analysis by aligning European and African training and capacity building programmes, including exchange

¹⁷⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

opportunities and networking with EU-AU and intra-Africa partners, and developing partnerships between universities.

- Designing actions that will support current and future activities under the PANAP network, building on the FNSSA roadmap and ensuring synergies and complementarities with the FNSSA partnership.
- Providing methods and strategies to promote recognition of the value of integration of scientific support within policy development in Africa and in Europe.
- Using digital technologies and information systems as a means to accelerate the translation of research results into policies.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee, to ensure a strong contribution of the project to the goals and activities of the PANAP network.

HORIZON-CL6-2023-FARM2FORK-01-18: Support for the implementation of a sustainable platform for the EU-African Union cooperation under the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If eligible for funding, legal entities established in all African Union Member States* may exceptionally participate in this Coordination and support action as a beneficiary or affiliated entity. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding.* "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p>

	<p>The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least five independent legal entities established in Africa.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁷⁷.</p>

Expected Outcome: In line with the European Green Deal priorities and in particular the farm to fork strategy, and in support of the African Free Trade Area, the successful proposal will contribute to the African Union (AU)-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Support to the implementation, functioning, consolidation and possible enlargement of a sustainable, and therefore long-term, platform for the EU-Africa Research & Innovation FNSSA partnership in the form of an International Research Consortium (IRC).
- Creation of a knowledge platform for sharing information on relevant research activities and results concerning the FNSSA roadmap.
- Maintenance and better coordination of EU-Africa research and innovation activities and investments in food nutrition security and sustainable agriculture in line with the FNSSA roadmap, thereby maximizing complementarities and avoiding duplication of efforts by supporting FNSSA Working Group.

Scope: Food and Nutrition Security and the Sustainability of Agriculture (FNSSA) are top priorities in the ‘Green Transition’ of the EU and Africa. It is recognised that there will be

¹⁷⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

more opportunities to achieve these common goals if the EU and Africa join forces. Therefore, the EU and the AU have adopted an enhanced Research & Innovation cooperation as their core strategy and approved a 10-year FNSSA Roadmap. To boost this FNSSA partnership, the Horizon 2020 project LEAP4FNSSA, has been tasked to establish a bi-continental platform to advance FNSSA, in the form of an International Research Consortium. It is expected that the International Research Consortium will be launched before the end of 2022 under the coordination of the project LEAP4FNSSA.

Proposals should address the following:

- Building on the work done by the Horizon 2020 project LEAP4FNSSA, the selected proposal should provide the necessary support to the implementation and the activities of the International Research Consortium.
- Building up and consolidation of a formal research cooperation between the EU and the AU on the issue of food nutrition security and sustainable agriculture, supporting the implementation of the FNSSA 10-year roadmap.
- Providing support in updating the FNSSA roadmap with new R&I priorities based on identified knowledge gaps as well as in identifying and developing joint flagship initiatives.
- Providing support to the establishment of the governance of the International Research Consortium and the set-up of working groups as necessary for the working of the International Research Consortium.
- Contributing a sound method for the analysis of the results of ongoing R&I activities, and the analysis of research gaps.
- Facilitating public access and knowledge sharing through a single online knowledge platform, with access to information and data from the existing database developed under the Horizon 2020 LEAP4FNSSA project.
- Organising the interaction with relevant projects and initiatives.

Activities will build on other initiatives which implement the FNSSA roadmap such as the ERA-Nets LEAP-AGRI and Food Systems and Climate (FOSC). Synergies with the European Commission's Knowledge Centre for Global Food and Nutrition Security will be explored.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee.

HORIZON-CL6-2023-FARM2FORK-01-19: Support to the markets and trade of agroecological food products under the Food and Nutrition Security and Sustainable Agriculture (FNSSA) partnership

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>Due to the scope of this topic, legal entities established in in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p> <p>The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least three independent legal entities established in Africa. The places of establishment of at least two of these legal entities must be in the same geographical region of Africa (as defined by the African Union: https://au.int/en/member_states/countryprofiles2).</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the African Free Trade Area and of the climate objectives of the African Union and the EU, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions

outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved assessment systems for agroecological food systems with co-benefits for producers, climate, biodiversity and citizens,
- Assessment of certification schemes, testing innovative solutions (e.g. digital solutions) with agro-food systems/certification actors, such as fair agricultural trade, ministries in charge and border regime management.
- Contribution to the joint EU-AU Innovation Agenda.

Scope: Agroecology¹⁷⁸ is a holistic approach that relies on and maximises the use of ecological processes to support agricultural production. By working more with nature and ecosystem services, it has the potential to increase farms' circularity, diversification and autonomy, while preserving/enhancing biodiversity, and drive a full transformation of farming systems and agricultural value chains, from input substitution and beyond. Agroecological farming systems therefore have great potential to enhance the sustainability performance of agriculture and agricultural value chains that contribute to the objectives of the EU farm to fork strategy and the FNSSA partnership.

Proposals should address the following:

- Conducting a scoping exercise on existing agroecological initiatives in Africa, including an analysis of what has worked or failed, and why.
- Increased competitiveness of the agroecological production for safe and nutritious food in Africa with improved quality and transparency in local, regional and international markets.
- Supporting training, and capacity building for actors in agro-ecological businesses and fair trades.
- Organising demonstration and networking events with relevant actors of the food chain, ranging from producers to final users, including administrations relevant for promoting agro-ecological food products.
- Implementation of the new technologies, including internet of things and artificial intelligence, to bring transparency to the agro-ecology food value chain.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the farming sector and all other relevant food chain actors.

¹⁷⁸ <http://www.fao.org/3/i9037en/i9037en.pdf>

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under topics HORIZON-CL6-2021-FARM2FORK-01-03: Digitalisation as an enabler of agroecological farming systems and HORIZON-CL6-2021-CLIMATE-01-05: Agroecological approaches for climate change mitigation, resilient agricultural production and enhanced biodiversity.

The consortium selected for funding is encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The possible participation of the JRC in the project could consist in the JRC joining the project steering committee and supporting the consortium to disseminate results of the activities developed by the project.

HORIZON-CL6-2023-FARM2FORK-01-20: EU-Africa Union – food safety

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: at least three partners from Africa and at least two from the same region as defined by the African Union (https://au.int/en/member_states/countryprofiles2).</p> <p>Due to the scope of this topic, legal entities established in in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>

<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.</p>
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Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the food safety systems of the African Union and the EU, the successful proposal will contribute to the first priority of the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation on Food and Nutrition Security and Sustainable Agriculture.

Regional integration, including through greater trade in goods and services, is one of the key aspirations of the African Union's (AU) Agenda 2063. The launch of the African Continental Free Trade Area (AfCFTA) has the potential to significantly accelerate growth and sustainable development, doubling intra-African trade and food trade in particular. While strong local food systems are a backbone of food security, trade contributes to resilient food systems by balancing between markets. The promotion of trade needs to take a start from the local, national and regional level to integrate food safety practices into all aspects of food production, distribution, marketing and consumption. Food safety is a pre-condition for food trade. It aligns with the recent AU decision to establish the Africa Food Safety Agency to ensure the coordination of food safety at the continental level¹⁷⁹

Projects results are expected to contribute to all of the following expected outcomes:

- Improved African food safety systems,
- Building blocks for improved food safety in Africa, improving climate, environment and food systems, reducing losses by mycotoxins, enhancing local transformation, local markets and regional trade, while reducing impacts on environment, biodiversity, health and society.

Scope: Proposals are expected to address the following:

- Contribute to a better understanding of food safety in the informal sector by generating data and evidence on trade actors in the informal sector. Improve the understanding of informal trade operations and ways to improve food safety for better access to nutritious food for urban and rural populations.
- Assess and recommend ways to maintain the informal sector's participation towards possible integration into the formal food system. Explore ways for its access to

¹⁷⁹ <https://www.fao.org/food-coalition/take-action/detail/en/c/1321182/>

infrastructure such as labs to be able to respond and manage the food safety risks along the chain.”

- Address regulatory aspects, including the risk of over regulation. Develop solutions towards a quality culture from the SME level going forward, including opportunities of better organization of SME in view of lower cost for certification and conformity assessment.
- Pilot training systems to help the informal sector towards compliance with food safety and quality schemes.
- Improve tools to improve risk assessment of health risks, including long term risks of mycotoxins. Risk assessment and other evidence should inform the regulatory systems.
- Contribute towards the development of a food safety strategy for Africa, including monitoring and an early warning system.
- Contribute to a better understanding how fermentation can reduce mycotoxin levels in food products.
- Identify solutions and business cases to improve microbiome based approaches such as traditional and new food fermenting, drying and coating processes for reducing food waste and promoting longer shelf lives. Develop approaches for scale-up.
- Adapting to climate change: reducing increased risks to food safety
- Implement the multi-actor approach by involving a wide range of food system actors and conducting trans- and inter-disciplinary research including an effective contribution of SSH disciplines.

Innovation: Proposals should foresee a space for mentoring and accelerating innovative business concepts, including social innovation and upscaling in view of African or European food business entrepreneurs and start-ups with special consideration of women and the diaspora using cascading funding opportunities. Proposals may involve financial support to third parties e.g. to academic researchers, start-ups, SMEs and other multidisciplinary actors, to, for instance, develop, test or validate developed assessment approaches or collect or prepare data sets or provide other contributions to achieve the project objectives... Consortia need to define the selection process of organisations, for which financial support will be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2024-FARM2FORK-01

Conditions for the Call

Indicative budget(s)¹⁸⁰

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ¹⁸¹	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-FARM2FORK-01-1	RIA	5.00	Around 5.00	1
HORIZON-CL6-2024-FARM2FORK-01-10	RIA	18.00	Around 6.00	3
HORIZON-CL6-2024-FARM2FORK-01-11	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-2	RIA	10.00	Around 5.00	2
HORIZON-CL6-2024-FARM2FORK-01-3	CSA	2.00	Around 2.00	1
HORIZON-CL6-2024-FARM2FORK-01-4	RIA	8.00	Around 4.00	2
HORIZON-CL6-2024-FARM2FORK-01-5	IA	6.00	Around 3.00	2
HORIZON-CL6-2024-FARM2FORK-01-6	RIA	10.00	Around 5.00	2
HORIZON-CL6-2024-FARM2FORK-01-7	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-8	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-01-9	IA	9.00	Around 4.50	2
Overall indicative budget		95.00		

General conditions relating to this call

Admissibility conditions

The conditions are described in General

¹⁸⁰ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

¹⁸¹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

	Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling sustainable farming systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-01-1: Agro-pastoral/outdoor livestock systems and wildlife management

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the

	Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁸² .
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Expected Outcome: In line with the objectives of the farm to fork strategy for a transition to fair, healthy and environmentally friendly livestock production systems, and of the EU biodiversity strategy for 2030, including the conservation status of certain habitats and species, the successful proposal will help policy makers and other actors to monitor and improve the management of farming and terrestrial wildlife relationships, thus contributing to sustainable agriculture and ecosystem services.

Project results are expected to contribute to all of the following outcomes:

- Innovative and sustainable practices and tools at landscape level to prevent and control negative consequences of interactions between livestock and wild animals to protect wildlife and pastoral/outdoor production systems
- Recommendations/policy advice on optimal management at EU level of wildlife and agro-pastoral systems
- Decision-making process on wildlife management and land planning participated by relevant stakeholders
- Improved coordination across Europe in terms of wildlife management, surveillance and data collection systems

Scope: Agro-pastoral/outdoor livestock farming systems, which include a large number traditional activities in Europe such as grazing systems, mountain livestock farming, transhumance, silvo-pastoral and agroforestry systems, offer beneficial effects not only to animal production, e.g., in case of scarce fodder resources, or to animal welfare, but also to habitat maintenance, carbon sequestration, biodiversity conservation and soil protection.

The increased demand for natural resources by human population with the consequent fragmentation of wildlife habitat, together with the increased population of wild animals and the change in land use have often resulted in human-wildlife conflicts. The interactions between livestock farmers and wildlife are more frequent and cause damages to both sides with conflicts in the management of farming systems and natural resources.

Wildlife population, which is worth protecting, occupies wide geographic area and extend across administrative borders, and public administrations face difficulties with regards to the reduction of the impact of wildlife on livestock farming. The implementation of a common

¹⁸² This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

and integrated approach at EU level is required to optimize the management of the co-existence of terrestrial wildlife (large carnivores, ungulates) and agro-pastoral/outdoor livestock systems at landscape level.

The following elements should be incorporated:

- Review of current wildlife management approaches in agro-pastoral/outdoor production systems in the different EU Member States and Associated Countries and assessment of the effectiveness of different prevention measures
- Map the most common types of damages caused and the positive externalities created by wild animals with respect to livestock and crops in Europe. Create an inventory of good practices and infrastructures at farms and regional levels, within a wider wildlife management approach.
- Improve or develop tools/technologies for (real time) data collection and analysis to assess, monitor and control (wild) animal behaviour and damages
- Cost/benefit analysis of current and new farming strategies that preserve, protect and valorise wildlife and pastoralism in different regions and ecosystems. Socio-economic, environmental, cultural and political aspects should be considered.
- Assess stakeholders' (farmers, hunters, conservationists, general public, policy makers...) perspectives and needs (participatory approach) and improve or develop effective instruments to reduce conflicts between livestock farming and wildlife. Identify the most effective measures to mitigate damages and the most common (monetary, non-monetary) compensation mechanisms across Europe.

The proposal should take into account projects funded under the LIFE programme, and interact and engage a dialogue with relevant EU organizations such as EU Platform on Coexistence between People and Large Carnivores¹⁸³.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in managing wildlife/livestock interaction (e.g., farmers, hunters, game farmers and producers, agricultural advisory services, land managers, ecology and nature conservation experts, animal behaviour scientists, social scientists and other relevant actors).

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Transforming food systems for health, sustainability and inclusion

Proposals are invited against the following topic(s):

¹⁸³ https://ec.europa.eu/environment/nature/conservation/species/carnivores/coexistence_platform.htm

HORIZON-CL6-2024-FARM2FORK-01-2: New healthy and sustainable food products and processes

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, and the EU’s climate ambition for 2030 and 2050, the successful proposal will support R&I to develop new food products and processes in conventional or organic production systems. These new products should be healthier and overall more sustainable and based on natural ingredients, tasty appealing to the consumer, affordable and minimally processed.

They should also optimize nutritional, structural and functional food properties of raw materials to enhance health and well-being benefits for EU and Associated Countries citizens and have a low impact on the environment/climate. This will contribute to the transformation of food systems to deliver co-benefits for climate, biodiversity, environmental sustainability and circularity, the shift to healthy and sustainable diets, safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Project results are expected to contribute to all of the following outcomes:

- New knowledge that the food industry can use in the design of new healthy and sustainable food products and processes to improve health and well-being of EU and Associated Countries citizens and with low impact on the environment/climate.
- Alignment in goals of consumers and food solution providers with more healthy, tasty, minimally processed, affordable and sustainable food.

- New market and job opportunities for sustainable food SMEs and industries.

Scope: Several studies in adults found a strong scientific concordance between consumption of ultra-processed foods and a higher risk of developing cancer, irritable bowel syndrome, obesity, type 2 diabetes and hypertension. Evidence is accumulating from mechanistic studies of the plausible causal pathways by which the physical structure and chemical compositions of these foods might cause harm. Additives or cocktail of additives could play a role in the incidence of NCDs and further R&I are needed. It is now widely accepted that a diet rich in plant-based food, such as fruits, vegetables, wholegrain cereals, legumes and nuts, may reduce the incidence of chronic diseases and is also beneficial against obesity and metabolic diseases. Further research is necessary to determine how the structural characteristics of plant-based foods deliver health benefits in modulating digestibility and in improving bioavailability of nutrients and how the physical structure may be modified by processing.

An increasing number of people pay attention to environmental, health, social and ethical issues and they seek value in food more than ever before. Therefore, a food systems' transformation is needed with a shift towards more healthy, safe, affordable, accessible and sustainable food for all, coupled with a respective change in the food production, distribution and consumption involving all the actors of the food chain.

A move to a plant-based diet with less red and processed meat, less salt, sugars, saturated and trans fats and additives, with more whole-grain cereals, fruit and vegetables, legumes and nuts, as well as processing efficiency and reduced losses and wastage along the food supply chains is needed. Where relevant, activities should build on and expand the results of past and ongoing research projects and collaborate with relevant initiatives.

Proposals are expected to address the following R&I activities:

- Develop and optimise new efficient methods/processes to reduce costs (e.g. energy, water, food raw materials) and impact on the environment to produce minimally processed functional food ingredients and food products and assess their nutritional, sensorial, structural and functional properties to enhance health and well-being, including the values provided by the plant/produce microbiome for nutritional qualities and its effects on the human gut microbiome.
- Develop new healthy, sustainable, diversified, minimally processed, reformulated, tasty and affordable food products and assess their nutritional, structural, sensorial and functional properties to enhance health and well-being and to improve nutrition status.
- Demonstrate the safety of the developed food products in accordance with relevant EU regulatory frameworks related to their placing on the market, and generate relevant data for pre-market authorisation,
- Investigate, assess and develop improved predictive realistic models for quantifying effects on human health (risks/benefits) of processing and food ingredients (and/or mixture of them).

- Study and optimise the role of the food matrix structure to make specific ingredients available or not (in case of caloric control) to our digestive system to reach the desired health effects/to combat non-communicable (NCDs).
- Ensure societal acceptance and the consumer buy in of new food products and processes in involving consumer at all stage of the product development process.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain and take into account sex and gender analysis.

Proposals could consider cooperation with of the European Commission's Joint Research Centre (JRC) research infrastructures (Nanobiotechnology laboratory) and its expertise at the interface between the research activities and regulatory aspects. In that respect, the JRC will consider collaborating with any successful proposal and this collaboration, when relevant, should be established after the proposal's approval.

HORIZON-CL6-2024-FARM2FORK-01-3: Thematic network tackling food fraud by translating research and innovation into practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy</p>

	Community (2021-2025). ¹⁸⁴ .
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Expected Outcome: In line with the farm to fork strategy the successful proposals will support increased authenticity, traceability and transparency in food systems. One of the strategy's main priorities is to tackle food fraud along the food supply chain. The successful proposals should therefore facilitate progress to preventing food fraud by translating research and innovation knowledge into practical applications.

Project results are expected to contribute to all of the following expected outcomes:

- Widespread use of existing new knowledge and innovative solutions by end-users/practitioners (official control authorities, food businesses, etc.) on the ground ensuring that food fraud is tackled;
- Improved flow of knowledge and innovative solutions with end-users through more dynamic interactions and new collaboration methodologies to prevent food fraud in the food supply chain;
- Better incorporation of the needs of end-users into the activities of research and innovation communities, which would generate a better targeted and shared food fraud research agenda for innovation-driven research.
- Improved skills and long-term availability of training and education material and on-line communities for end-users on how to tackle food fraud.

Scope: Proposals are expected to contribute to the creation of a thematic network in the area of food fraud, including all of the following activities:

- Development of a community of practice to foster knowledge exchange between end-users and research and innovation ecosystems who will work together mapping existing food fraud practices. Traditional and local food products should be taken into consideration in this community of practice;
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia and research-technology organizations with end-users (official control authorities, food businesses, industrial clusters, etc.) and other relevant actors of the food chain;
- Compilation of a comprehensive description of the state of new knowledge, practices, procedures, systems and technologies tackling food fraud (including not only technologies for detection but also preventative approaches). Proposals should build on existing and new available knowledge and trends, data and models (including big data tools and/or artificial intelligence applied to food fraud). Proposals should focus on the

¹⁸⁴ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

cost/benefit aspects of the practices and innovations collected and build on existing and new available knowledge, data and models enabling the practical implementation of solutions;

- Creation of tailor-made communication materials summarizing, sharing and presenting, in a language easily understandable for end-users, existing best practices and innovations that are close to implementation into practice, but not sufficiently known by end-users;
- Identification and mapping of possible relations and synergies with other networks, projects, initiatives and policy and funding instruments at regional, national and European level, that could help disseminate and exploit knowledge and results, showing the added value of these inter-connections. Dissemination via public events, publication of case studies, dissemination papers and reports, and the creation of an on-line collaborative space that remain active in the long-term including the availability of materials for training and education;
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under the topics HORIZON-CL6-2021-FARM2FORK-01-07, HORIZON-CL6-2021-FARM2FORK-01-17, HORIZON-CL6-2022-FARM2FORK-01-11 and HORIZON-CL6-2022-FARM2FORK-01-04.
- Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. Proposals could also foresee the involvement of the European Network of GMO Laboratories (ENGL).
- Cross-articulation with the other data spaces, and notably with the European Open Science Cloud (EOSC) should be foreseen, exploiting synergies and complementarities of the different approaches. Efforts should be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable)
- Proposals should run for minimum 3 years.

HORIZON-CL6-2024-FARM2FORK-01-4: Climate change and food safety: effects of climate change on food safety across food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions

<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).¹⁸⁵.</p>

Expected Outcome: The successful proposal will be in line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support R&I to foster advances in research related to integrated approaches along the food system for detecting, assessing, and mitigating food safety risks influenced by climate change. This is along with contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Project results are expected to contribute to all of the following expected outcomes:

- Improved understanding of the medium to longer-term climate change impacts in relation to food safety, and the effect these could have on food systems actors from farm to fork;
- Identification, development and widespread dissemination of mitigation and adaptation measures to reduce/prevent climate change-related food safety risks (individual and cumulative risks). Contribution to the farm to fork strategy objectives, in particular the contingency plan for ensuring food supply and food security and deliver co-benefits on each of the Food 2030 priorities as well as contributing to policy and food safety risk assessment needs and priorities, in particular regulatory control and enforcement aspects.

Scope: Proposals should contribute to all of the following aspects:

¹⁸⁵ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, food businesses and other relevant actors of the value chain.
- Anticipate, including through modelling, how climate change may affect food safety in Europe and in particular by increasing the potential for the emergence/re-emergence of new hazards and the changes in exposures and risks;
- Propose methods to monitor the impact of climate change on food safety across food systems and their main critical areas. Explore how climate change could impact risk assessment methods and understand how risk assessment methodologies may need to evolve to meet new climate changed related challenges;
- Analyse the effect of climate change (extreme temperatures, etc.) and its impact with respect to: existing food safety hazards throughout the entire food supply chain (from farm to fork), and risk factors including the appearance of (re)emerging hazards.
- European regions should participate as "demonstrators" areas facilitating research and innovation under different climate conditions;
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic or other topics such as the HORIZON-CL6-2021-BIODIV-01-11 and HORIZON-CL6-2021-FARM2FORK-01-16 and ensure synergies with relevant activities carried out under other initiatives such as the One Health European joint programme and the LIFE programme ("Strategic Integrated Projects") due to their regional and climate approach.
- Proposals should also foresee the involvement of the European Food Safety Authority (EFSA) as part of the future action once the project starts.

In addition proposals are encouraged to:

- Increase the use of big data and/or artificial intelligence to elucidate the complex interactions between climate change and food safety. Proposals are expected to develop models to understand these interactions experimented and analysed for their replication potential. Proposals might build on existing and new knowledge, data, and models exploiting the full potential of big data and/or artificial intelligence;
- Explore, map and propose funding synergies strategies among European, national and regional programmes and instruments under this scope in a long-term vision;
- Connect research and innovation activities in this topic with start-ups ecosystems.

HORIZON-CL6-2024-FARM2FORK-01-5: Creating smart and attractive tools to enhance healthy and sustainable food provision, eating and treating of food at home

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ¹⁸⁶ .

Expected Outcome: The topic is in line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050. This will contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, environment, circularity and resource efficiency, innovation and empowering communities. The EU's farm to fork strategy states that: "European diets are not in line with national dietary recommendations, and the 'food environment'¹⁸⁷ does not ensure that the healthy option is always the easiest one".

The overall aim of this topic and associated R&I activities is to enhance healthy and sustainable diets aligned with national dietary advice by empowerment of citizens and their capacity to eat and cook at home in line with budgetary and time constraints as well as their

¹⁸⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

¹⁸⁷ European Public Health Alliance (2019) "Food environments are the physical, economic, political and socio-cultural contexts in which people engage with the food system to make their decisions about acquiring, preparing and consuming food." <https://epha.org/what-are-food-environments/#:~:text=%E2%80%9CFood%20environment%20refers%20to%20the,%2C%20preparing%20and%20consuming%20food.%E2%80%9D>

living situation. The activity will develop tools that can be considered by national competent authorities for implementation. Interventions should not target citizens directly, as full alignment with national policies and advice on nutrition and health needs to be ensured.

Projects results are expected to contribute to all the following expected outcomes:

- Empowered citizens supported by tools and applications to make healthy and sustainable food provision, cooking and eating, and treating of food at home the easiest choice;
- Enhanced uptake of beneficial tools and applications by citizens, especially those who need it most, considering socio-economic characteristics and differences across EU and Associated countries.

Scope: Urban lifestyles have led to more consumption of ultra-processed and packaged food¹⁸⁸. Cooking skills may enhance healthy and sustainable diets, so supporting consumers provides potential¹⁸⁹. There are also indications, that social change might be enhanced by encouraging minorities to publicly challenge unsustainable norms during social interactions¹⁹⁰. This potential can be exploited to drive change in behaviour by citizen engagement.

Proposals are expected to address the following:

- Develop tools and applications that enhance citizens to have a healthy and sustainable food provision, diet and treating of food at home/ or discourage unhealthy and unsustainable choices that can be considered by national policy makers and private actors;
- Include in approaches ‘culinary culture dimension’ such as based on nationality, religion, culture, regionality and seasonality etc., and time and financial constraints;
- Engage citizens in solutions to create inclusive and sustainable solutions for broad uptake;
- Ensure that national nutritional policies and advice are respected as well as food safety;
- Link solutions to the issue of food waste and to the need to reduce household wastes generally, notably plastics, as part of a circular economy to include all aspects of sustainability tools that can be considered by national policy makers for implementation;
- Take a holistic approach, e.g., delivery (including prepared meals, micro deliveries, decentralised pick-up points) including transport and distribution aspects, short supply chains, marketing, sustainable packaging, recycling and reduction in food waste;

¹⁸⁸ FAO. “Urban Food Action (UFA)”, 2019

¹⁸⁹ Hartmann, C., Dohle, S., Siegrist, M. Importance of cooking skills for balanced food choices, *Appetite* 65 (65), 125-131, 2013

¹⁹⁰ Bolderdijk, W.M., Jans,L. Minority influence in climate change mitigation, *Current Opinion in Psychology* 41, 25-30, 2021 <https://doi.org/10.1016/j.copsyc.2021.02.005>

- Develop a sample plan to make available to Member State and Associated Countries authorities for several countries on how to enhance uptake of beneficial tools and applications considering different socio-economic characteristics of citizens and national laws.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of among others health actors, such as nutritionists, doctors and nurses.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and under the topic HORIZON-CL6-2021-FARM2FORK-01-15: “Transition to healthy and sustainable dietary behavior”.

Proposal should apply social innovation and citizen engagement for inclusive and long-term solutions beyond the life cycle of the project and include a strong involvement of citizens/civil society, together with academia/research, industry/SMEs/start-ups and government/public authorities.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-6: Citizens’ science as an opportunity to foster the transition to sustainable food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: This topic is in line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050. This will contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, environment, circularity and resource efficiency, innovation and empowering communities, and thriving businesses.

Data-driven solutions in food systems also benefit the European Open Data Directive to share public data¹⁹¹ and envisioned data spaces¹⁹² as well as provide a base of AI deployment as enablers of the European Green Deal objectives.

Projects results are expected to contribute to all the following expected outcomes:

- Better understanding of citizens' food consumption behaviour, the factors influencing choices and drivers that would facilitate changes in behaviour in an inclusive manner towards healthy and sustainable food consumption practices;
- Contribution to positive changes in individual behaviour towards healthy and sustainable food consumption and sustainable food system transformation.

Scope: Currently, consumers are sceptical to share data, least to the government¹⁹³. As there is a need for more data-driven decision making, engaging citizens in research through the provision of data on their practices, choices and attitudes towards the food system provides potential for a more direct citizen engagement in transforming food systems. The approach allows to exchange ideas, solutions, and opinions to encourage Responsible Research and Innovation (RRI) in driving sustainable food system transformation.

Citizen's science¹⁹⁴ is a fast-growing mode of research and innovation¹⁹⁵ that can allow for enhanced food system transformation driven by engagement, trust and transparency. It can leverage relevant private relevant data to take stock of current citizens' behaviour towards the food system, including aspects such as food consumption, marketing and food environment influence, health, mobility, regionality/locality, food-related waste generation and management, etc. by using collective intelligence.

Proposals are expected to address all the following:

- Explore the potential of 'citizen's science' in the food systems domain by engaging and empowering citizens in using and providing data and technology to ensure inclusive solutions to drive sustainable food system transformation by promoting sustainable food consumption, reducing food waste, and creating a resilient food system;

¹⁹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L1024&from=EN>

¹⁹² [DIGITAL WP 2021-2022](#)

¹⁹³ L. Timotijevic, S. Astley, M.J. Bogaardt, T. Bucher, I. Carr, G. Copani, J. de la Cueva, T. Eftimov, P. Finglas, S. Hieke, C.E. Hodgkins, B. Koroušić Seljak, N. Klepacz, K. Pasch, M. Maringer, B.E. Mikkelsen, A. Normann, K.T. Ofei, K. Poppe, G. Pourabdollahian, M.M. Raats, M. Roe, C. Sadler, T. Selnes, H. van der Veen, P. van't Veer, K. Zimmermann, Designing a research infrastructure (RI) on food behaviour and health: Balancing user needs, business model, governance mechanisms and technology, Trends in Food Science & Technology, Volume 116, 2021, Pages 405-414, <https://doi.org/10.1016/j.tifs.2021.07.022>, Note: this paper discusses an international research infrastructure.

¹⁹⁴ Citizen science n. scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions (Oxford English Dictionary)

¹⁹⁵ [wp-11-widening-participation-and-strengthening-the-european-research-area_horizon-2021-2022_en.pdf \(europa.eu\)](#)

- Identify the challenges and drivers encouraging citizens to share data to ensure inclusive food system transformation;
- Develop and test tools by using data and technology to enhance uptake of healthy and sustainable diets and foster sustainable food system transformation;
- Explore which data types are most useful to share (behavioural data, data from private providers, such as data gathered by relevant apps, stated data...etc.) and how to meaningfully harmonize data to use data for food system transformation by different actors, and which tools to best make use of, such as Artificial Intelligence (AI) while analysing how consumer data can be shared in an anonymized and safe way complying with the General Data Protection Regulation (GDPR) rules;
- Make concrete efforts to ensure that the data produced in the context of this project is FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide “FAIR-by-design” data, i.e., data that is FAIR from its generation;
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this and the topic [HORIZON-CL6-2022-GOVERNANCE-01-10](#) “Piloting approaches and tools to empower citizens to exercise their “data rights” in the area of food and nutrition” and HORIZON-WIDERA-2021-ERA-01-60: “A capacity-building and brokering network to make citizen science an integral part of the European Research Area”;
- Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.
- Connect personal data on food to other areas, such as mobility and health and identify synergies; projects shall leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud and, where relevant, establish synergies with the Data Space for smart communities¹¹ and make use of open standards and technical specifications, for example the Minimum Interoperability Mechanisms (MIMs Plus);
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of citizens/civil society, together with academia/research, industry/SMEs and government/public authorities and include social innovation as the solution is at the socio-technical interface and requires social change, new social practices and social ownership;
- This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-7: Impact of the development of novel foods based on alternative sources of proteins

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environment-friendly food system, and the EU’s climate ambition for 2030 and 2050, the successful proposal will support R&I to promote the production, provision and safe consumption of alternative sources of protein, and dietary shifts towards sustainable healthy nutrition, contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable healthy nutrition and safe food, food poverty reduction, empowerment of communities, and thriving businesses.

Novel foods are foods that have not been consumed to a significant extent in the EU before 15 May 1997. They can be newly developed, innovative foods, foods produced using new technologies and production processes, as well as foods that are or have been traditionally eaten outside of the EU. Alternative sources of proteins (i.e. other than conventional sources of proteins such as meat and dairy or mainstreamed from classical crops) may be considered as novel foods. Novel Foods can only be authorised in the EU market if they do not pose any risk to human health, the food’s intended use does not mislead consumers and are not nutritionally disadvantageous.

Projects results are expected to contribute to all of the following expected outcomes:

- Better and complete information provided about the impact this specific innovation, i.e. the development of novel food (e.g., insect protein, micro and macro algae-based products, microbial proteins, food/aquaculture by-products) would have especially for the food system in terms of sustainability (particularly economic and social aspects).
- Solutions that can help achieving the objectives of the European Green Deal, especially the farm to fork strategy, and Food 2030 priorities: nutrition for sustainable healthy

diets, climate and environment, zero pollution, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope:

- Assess the potential of insect protein, micro and macro algae-based products, microbial proteins and/or food/aquaculture by-products in terms of market development taking into account the farm to fork strategy objectives based on up-to-date/new knowledge about them.
- Assess their economic impact (e.g., price, production cost, share of market, etc.) and assess the impact such development will have on other sectors, across the food and the bio-based systems.
- Assess their social impact (e.g., health aspects, consumer acceptance including considering gender and age aspects, cultural aspects).
- Assess their potential (as well as related risks and trade-offs) to address the most relevant European Green Deal objectives, including environmental ones, compared to conventional sources of proteins (e.g. meat and dairy), and the need to shift to sustainable and healthy diets.
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.
- International cooperation is strongly encouraged.
- Where relevant, activities should build and expand on the results of past and ongoing research projects (especially related to environmental aspects developed by the projects funded under HORIZON-CL6-2021-FARM2FORK-01-12 and HORIZON-CL6-2022-FARM2FORK-01-07, and projects funded under other relevant topics in this Work Programme). Projects should have a clear plan as to how they will collaborate with other projects selected under this topic (if funding of more than one project is possible) and any other relevant topic. They should participate in joint activities, workshops, focus groups or social labs, and common communication and dissemination activities, and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

HORIZON-CL6-2024-FARM2FORK-01-8: Preventing and reducing food waste to reduce environmental impacts and to help reach 2030 climate targets

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a

<i>project</i>	proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>

Expected Outcome: In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environmentally friendly food system, and the EU's climate ambition for 2030 and 2050, the successful proposals will support R&I to prevent and reduce food waste¹⁹⁶. They should therefore contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, sustainable food consumption, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all the following outcomes:

- Reliable data on the environmental impacts related to food waste, in particular GHG emissions;
- Better understanding of the food waste prevention efforts that will accelerate EU's progress to reach climate targets and will help reduce environmental impacts (including on biodiversity) across the food supply chain;
- Integration of actions related to food waste prevention/reduction into emission reduction instruments, national energy and climate plans and other relevant EU initiatives;
- Contribution to the farm to fork objectives and to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

Scope: Climate change and environmental degradation are recognised as the main challenges to tackle in the European Green Deal. Food waste prevention and reduction could contribute to climate change mitigation and adaptation, pollution reduction, better air quality, biodiversity preservation...

¹⁹⁶ Definition of food waste included in the [Waste Framework Directive](#): *Food waste means all food as defined in Article 2 of Regulation (EC) No 178/2002 of the European Parliament and of the Council that has become waste.*

The 2030 climate target plan sets out to raise the EU's ambition on reducing greenhouse gas emissions to at least 55% below 1990 levels by 2030.

Member States have prepared integrated national energy and climate plans (NECPs) to achieve their 2030 targets.

The Commission brought support and expertise to Member States in the elaboration of their NECP and will continue to do so by supporting the full implementation of the plans, and prepare their update due in 2023¹⁹⁷.

Key policies within the framework of the European Green Deal also include the EU biodiversity strategy for 2030, the farm to fork strategy, and the EU zero pollution action plan.

Proposals should address all the following points:

- Provide reliable quantitative data for several Member States/Associated Countries on the environmental footprint of food waste, based on Life Cycle Assessments, and more specifically the Product Environmental Footprint (PEF) method developed by the European Commission.
- A specific focus on the following Environmental Footprint (EF) impact categories identified in the PEF method is required:
 - o Climate change (main focus)
 - o Land use
 - o Water use
 - o Resource use
 - o Other relevant categories that could help assess the impacts on biodiversity.
- Combined data for the entire food supply chain but also data for each stage of the food supply chain¹⁹⁸ are expected, including a focus on sorting, storage, logistics and waste treatment. A detailed analysis for relevant food products is also expected.
- Concerning the climate change category in particular, provide estimates on the life cycle GHG emissions due to food waste. Potential double counting of avoided emissions should be analysed. If possible, these data would have to be compared to GHG reductions assumed by Member States in the NECPs – in order to enable measuring of potential impact from food waste prevention measures towards reaching the objectives of NECPs.

¹⁹⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0564&from=EN>

¹⁹⁸ The main stages of the food supply chain identified by the Commission in the Delegated Decision (EU) 2019/1597 establishing a common EU methodology to measure food waste: primary production; processing and manufacturing; retail and distribution; restaurants and other food services; households.

- Elaborate different pathways of food waste prevention/reduction interventions and assess their potential for climate change adaptation/mitigation, reduction of pollution and preservation of biodiversity. The analysis should be carried out for several types of stakeholders.
- Assess the potential for rebound effects due to food waste reduction¹⁹⁹.
- Carry out mapping activities of relevant emission reduction and funding instruments and other EU initiatives in which food waste prevention/reduction could be well integrated.
- Establish a set of recommendations on how to integrate food waste prevention/reduction in those instruments and initiatives (including NECPs).
- Implement the multi-actor approach (see eligibility conditions) by conducting inter- and trans-disciplinary research and involving a wide range of food system actors (including possibly food start-ups).

Proposals should also build on past or ongoing research projects and ensure synergy with relevant initiatives. In particular, they should build on the work done by the Commission’s Joint Research Centre in support of the EU Platform on Food Losses and Food Waste²⁰⁰ and be aligned with the Environmental Footprint method developed by the Commission. The possible participation of the JRC in the project would consist of gathering data collected in the projects into a consistent framework for modelling food waste. It will also ensure that the proposed approach will be compatible with existing databases for the assessment of environmental impacts and aligned with the Environmental Footprint method, helping translating results into policy relevant outputs.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and any other relevant topic, e.g. by participating in joint activities, workshops, etc. Selected proposals under this topic will thus need to work together and adapt their initial work plan. Communication and dissemination activities should also be grouped and coordinated in a complementary manner.

This topic requires the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-01-9: Microbiome for flavour and texture in the organoleptic dietary shift

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately.

¹⁹⁹ e.g.: if households save money through reducing waste, they may use this additional income to purchase other products/services with potentially higher environmental impacts. e.g.: impact from reduction of food waste on energy generated from waste.

²⁰⁰ https://ec.europa.eu/food/safety/food-waste/eu-actions-against-food-waste/eu-platform-food-losses-and-food-waste_en

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding. The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: The successful proposal should be in line with the European Green Deal priorities, the farm to fork strategy and Food 2030 priorities²⁰¹ for a fair healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050. It will support innovation to foster advances related to microorganisms for safer, healthier and more environmentally friendly food industry. This is in addition to contributing to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to all of the following expected outcomes:

- Applicable business solutions in new precision fermentation/ post-fermentation techniques;
- Develop bioinformatics prediction of smell, texture, colour and taste of microbes to create new nuances and flavours in cooperation with chefs/restaurants;
- New, improved and demonstrated microbial fermentations to yield dairy, fish or meat flavours and textures to plant-based foods and ingredients as well as to exploit flavour and texture enhancing properties of fermented vegetables;
- Clearly explain how the proposal will deliver co-benefits to each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

²⁰¹ https://ec.europa.eu/info/publications/food-2030-pathways-action-research-and-innovation-policy-driver-sustainable-healthy-and-inclusive-food-systems-all_en

Scope: The need for a holistic approach to realize the full potential of microbiome innovation has to develop bioinformatics prediction of smell and taste of microbes to create new nuances and flavours.

Proposals are expected to address the following:

- Develop and pilot innovations to provide new precision fermentation/ post-fermentation techniques to foster dietary shift by enhancing organoleptic properties (smell, texture, colour, taste).
- Development of new microbial biomasses that can be a source of micro and macro nutrients for humans.
- Demonstrate the safety of the developed approach, in accordance with relevant EU regulatory frameworks, related to its placing on the market.
- Produce food with higher nutritional quality, and potential for positive effects on the human microbiome.
- Assess the economic and social impact of the products.
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of academia, research-technology organizations, small-medium enterprises (including start-ups), restaurants, food businesses and other relevant actors of the value chain.
- In order to achieve expected outcomes international cooperation is strongly encouraged, in particular in the framework of the International Bioeconomy Forum.
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics. They should participate in joint activities, workshops, focus groups or social labs, as well as organise common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.

Targeted international cooperation

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-01-10: EU-African Union cooperation on agroforestry management for climate change adaptation and mitigation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 18.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</p> <p>The following additional eligibility criteria apply: the places of establishment of at least two of these legal entities must be in the same geographical region of Africa (as defined by the African Union: https://au.int/en/member_states/countryprofiles2).</p> <p>The following additional eligibility criteria apply: due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, consortia must include at least three independent legal entities established in Africa.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the climate objectives of the African Union (AU) and the EU, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its priority on Green Transition (and the respective R&I partnerships on Food and Nutrition Security and Sustainable Agriculture and Climate Change and Sustainable Energy), as well as to the implementation of the short-term actions outlined in the working document of the AU-EU Innovation Agenda, aiming to translate R&I efforts into tangible business, development and employment opportunities in Africa and Europe.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved availability of qualitative and quantitative data pertaining to the contribution of agroforestry to climate change adaptation and mitigation, biodiversity preservation, and to sustainable agriculture;

- Improved management of agroforestry systems (conventional, agroecological and/or organic), including agro-pastoral systems, in Africa;
- Enhanced capacities to evaluate the socioeconomic and environmental performance of agroforestry for climate change resilience;
- A strengthened agroforestry innovation ecosystem for better user acceptance and implementation of agroforestry in the African Union (AU).

Scope: Achieving sustainable agricultural production that fosters both climate change mitigation and adaptation and biodiversity preservation and enhancement is a policy objective that implies finding a balance with farm productivity, socio-economic viability and wider sustainability goals. Agroforestry systems include both traditional and modern land-use systems where trees are managed together with crops and/or animal production systems in agricultural settings. These systems have the potential to increase ecosystem services – including soil carbon sequestration, water retention, erosion control, soil nutrients, pollination, pest- and disease-control – and biodiversity, while improving farming productivity, profitability and sustainability of farmers’ incomes. Implementation of agroforestry in the EU and the AU needs to be boosted in order to maximise this potential. The management of agroforestry systems is critical for their positive impact on climate and the environment as well as to ensure a balance with productivity and profitability for farmers. This is essential to promote the uptake and long-term sustainability of agroforestry.

Proposals should address the following:

- Identification of the most suitable plant and animal species and breeds to be used in agroforestry for different geographic regions in Africa, generating sustainable ecosystems with positive impact on local communities, and on women, looking for models where this impact is greater. In vegetation management systems preference should be given to local species, to avoid potential unintended consequences linked to the introduction of alien species;
- Assessment of local multi-purpose agroforestry species and breeds with benefits for food, pharmaceutical uses as well as ecosystem functions for the soil, biodiversity and their functions in a vegetation mosaic;
- Assessment of specific agroforestry management measures aiming at preserving/enhancing biodiversity;
- Assessment of the potential of carbon farming²⁰² as a possible future business for farmers and foresters, and analysis of its potential to contribute to reaching climate-neutrality in a few decades;

²⁰² https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles/carbon-farming_en

- Identification of the structural needs of agroforestry crops and animals in different geographical regions in Africa, including the analysis of production burdens, suggesting solutions and addressing traceability of all steps in the production chain to measure the effectiveness of solutions;
- Supporting this new value chain with knowledge and capacity building to be efficient, fair, and easily adopted, or not abandoned, by landowners and farmers;
- Establishing local agroforestry pilot plots.

Proposals must implement the “multi-actor approach” including a wide range of actors to ensure that knowledge and needs from various sectors, such as research, farmers/foresters, advisory services, are brought together.

This topic should involve the effective contribution of SSH disciplines.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, as well under topic HORIZON-CL6-2021-CLIMATE-01-08: ‘Agroforestry to meet climate, biodiversity and farming sustainability goals’.

HORIZON-CL6-2024-FARM2FORK-01-11: EU-African Union – towards climate-neutral, social just fair trade food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: at least three partners from Africa and at least two from the same region as defined by the African Union (https://au.int/en/member_states/countryprofiles2).</p> <p>Due to the scope of this topic, legal entities established in all African Union member states* are exceptionally eligible for Union funding. * "African Union member states" includes countries whose membership has been temporarily suspended.</p> <p>International organisations with headquarters in a Member State or</p>

	<p>associated country are exceptionally eligible for funding.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.</p>

Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environment-friendly food system, and in support of the African Continental Free Trade Agreement, the successful proposal will contribute to the AU-EU High Level Policy Dialogue (HLPD) on Science, Technology and Innovation, and its first priority on Food and Nutrition Security and Sustainable Agriculture.

The farm to fork strategy aims to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact, help to mitigate climate change and adapt to its impacts. New opportunities in EU-African trade are opening-up for trade regimes with co-benefits for producers, climate and citizens. Innovative Information and Communications Technology (ICT) based, traceability and certification schemes should maximise co-benefits while helping to keep the effects of Non-Tariff Measures (NTMs) in particular administrative and transaction costs low.

The African countries signed the African Continental Free Trade Agreement and launched an action plan for Boosting Intra-African Trade with a view to strengthening regional integration. It is also one of the key priorities of the Africa Agenda 2063 and a major step towards African continental economic integration.

Project results are expected to contribute to all of the following expected outcomes:

- Improved assessment systems for sustainable food trade regimes with co-benefits for producers, climate and citizens, biodiversity, assessment of certification schemes (organic, carbon neutral, de-forestation free, conventional), testing innovative solutions with food systems/certification actors;
- Provide data and recommendations for improved Non-Tariff Measure (NTM) regimes;
- Provide solutions to food trade, Ministries in charge, border regime management (digital solutions).

Scope: Proposals are expected to address the following:

- Study the tipping points to scale-up climate-neutral, fair and just food supply;
- Explore the climate, biodiversity and social impacts of food supply (organic and conventional) and linked products due to land-use change;
- Better understanding of the aim, collection, quantification and modelling of NTMs relevant for intra-African and EU-AU trade relations;
- Clearly explain how the proposal will contribute towards scaling-up of business models of climate-neutral fair and just and efficient food supply;
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research;
- Link to previous projects on urban – rural food systems for solutions to strengthen resilience of food systems in view of supply and/or price shocks.

Innovation: Proposals should foresee a space for mentoring and accelerating innovative business concepts, including social innovation and upscaling in view of African or European food business entrepreneurs and start-ups with special consideration of women and the diaspora using cascading funding opportunities. Proposals may involve financial support to third parties e.g. to academic researchers, start-ups, SMEs and other multidisciplinary actors, to, for instance, develop, test or validate developed assessment approaches or collect or prepare data sets or provide other contributions to achieve the project objectives... Consortia need to define the selection process of organisations, for which financial support will be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Call - Fair, healthy and environmentally-friendly food systems from primary production to consumption

HORIZON-CL6-2024-FARM2FORK-02

Conditions for the Call

Indicative budget(s)²⁰³

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution	Indicative number of

²⁰³ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

		2024	per project (EUR million) ²⁰⁴	projects expected to be funded
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-FARM2FORK-02-1-two-stage	IA	12.00	Around 6.00	2
HORIZON-CL6-2024-FARM2FORK-02-2-two-stage	IA	11.00	Around 5.50	2
HORIZON-CL6-2024-FARM2FORK-02-3-two-stage	IA	8.00	Around 4.00	2
HORIZON-CL6-2024-FARM2FORK-02-4-two-stage	RIA	13.00	Around 6.50	2
HORIZON-CL6-2024-FARM2FORK-02-5-two-stage	RIA	7.00	Around 7.00	1
HORIZON-CL6-2024-FARM2FORK-02-6-two-stage	IA	9.00	Around 4.50	2
HORIZON-CL6-2024-FARM2FORK-02-7-two-stage	IA	9.00	Around 4.50	2
Overall indicative budget		69.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.

²⁰⁴ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling sustainable farming

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-02-1-two-stage: Increasing the availability and use of non-contentious inputs in organic farming

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 7-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage

	proposals will be evaluated blindly.
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Expected Outcome: A successful proposal should support the objective of the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to promote and increase organic farming in Europe, in line with the target of at least 25% of the EU's agricultural land under organic farming by 2030. Activities will support the implementation of concrete actions in the EU action plan for the development of organic production²⁰⁵ and of Regulation (EU) 2018/848 on the rules on organic production and labelling of organic products²⁰⁶. Activities will also support the farm to fork and biodiversity strategies' objective to reduce the risk and use of chemical pesticides by 50% and the use of more hazardous pesticides by 50%.

Project results are expected to contribute to all of the following expected outcomes:

- Increased availability, accessibility and adoption by farmers of cost-efficient alternatives to contentious inputs used in organic farming;
- Fair, reliable and implementable rules on the use of inputs in organic farming;
- Significantly reduced environmental impact of practices and input use in organic farming systems and enhanced organic crop and livestock production;
- Provision of scientific support and recommendations for the development, implementation and evaluation of EU policies and strategies relevant for organic production, in particular on the reduction of contentious inputs as well as on the increased use of alternative products, strategies and solutions;
- Increased networking and knowledge exchange among all relevant actors for organic farming, contributing to a strengthened research and innovation ecosystem on organic farming in Europe that also supports the spreading of research outcomes to farmers involved in low-input farming and/or agroecological production.

Scope: Promoting the use of more sustainable farming practices is a policy objective enshrined in the European Green Deal and its related strategies. Boosting organic farming, one of the objectives of the farm to fork and of the EU biodiversity strategies, can greatly contribute to achieving this ambition, and thereby also contributing to climate ambition as, as organic farming contributes directly and significantly to carbon storage in soils and biomass. Moreover, the Commission communication 'Safeguarding food security and reinforcing the resilience of food systems'²⁰⁷ highlights the role that organic farming can play in reducing the EU's dependence on external inputs, since organic farming is recognised, among others, for the limitation in the use of off-farms inputs.

²⁰⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>

²⁰⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018R0848>

²⁰⁷ https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/safeguarding-food-security-reinforcing-resilience-food-systems.pdf

The organic legislation authorises the use of a specific set of products with a lower impact on the environment and on the soil. However, some of these substances have a harmful effect on terrestrial and aquatic species, which calls for the need to replace these substances either by lower impact products or methods or by resistant varieties. It is important to continue exploring ways to phase out and replace contentious inputs used in organic farming, and to increase the availability, accessibility and use of alternatives to these products. In doing so, due attention should be given to system approaches that consider the entire farm system, and its relation with the territorial and landscape levels. Moreover, in order to address farmers' needs in this specific area, socially innovative solutions are required.

Proposals should develop scientifically robust and transparent methodologies, building on achievements from previous research activities, notably those funded under the Horizon 2020 call 'SFS-08-2017 - Organic inputs – contentious inputs in organic farming' (projects Organic-PLUS and RELACS).

Proposals should address all the following activities:

- Develop, test and put in the place alternative products and solutions, including to the use of copper fungicides, mineral oils, external nutrient inputs (e.g. manure from conventional agriculture, recycled nutrients) in organic plant production, and to the responsible use of anthelmintics, antibiotics and synthetic vitamins used in organic livestock production.
- Among the alternatives, consider those containing biologically active substances (microorganisms and other naturally occurring substances), invertebrate biological control agents, (micro)biological agents for soil amelioration or cultivation techniques, and considering effective functional biodiversity systems.
- Building on existing demonstration sites and experiments where available and relevant, test the alternatives and, if relevant, their combinations.
- Further develop toolboxes, strategies and technologies for the minimisation or phasing-out of the use of contentious inputs in organic farming.
- Demonstrate the safety of the alternatives, in line with the EU regulatory framework related to their placing on the market, and generate data to enable the registration of the alternatives.
- Deepen analysis and produce data on the efficacy, resource efficiency, climate and environmental impacts of the alternatives developed, compared to the contentious inputs they are to replace. This should include analysis of impact on non-target species and on human health.
- Analyse farmers' and consumers' acceptance of the alternatives developed and consider new governance models/relations among food chain actors. This should include the development of business plans, with the support of Agricultural Knowledge and Innovation Systems (AKIS), and assessment of stakeholders' (farmers, policymakers,

researchers, advisors, companies, consumers, etc.) perspectives and needs to improve already existing policy instruments to reduce the use of contentious inputs and increased availability of alternatives.

- Set up demonstration sites that are representative of the diversity of organic farming systems in Europe, to promote participatory activities, and the exchange of knowledge and best practices among farmers.
- Develop training packages targeted to farmers and other actors of the organic agri-food chain, and awareness raising activities towards citizens and consumers, engaging with existing initiatives where relevant.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the main stakeholders involved in finding alternatives to the use of contentious inputs used in organic farming (farmers, breeders, researchers, advisors, industry, etc.). Proposals should cover contentious inputs used in a range of organically-grown crops (in- and out-door), both arable and perennial, as well as the organic livestock sector. Sectors with high economic relevance in different pedo-climatic conditions and various biogeographical regions should be targeted in a representative way. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure coherence and synergy with other relevant activities carried out under other initiatives in Horizon Europe, including under the topic HORIZON-CL6-2023-GOVERNANCE: 'Developing an EU advisory network on organic agriculture', HORIZON-CL6-2024-GOVERNANCE: 'Organic farming thematic network to compile and share knowledge ready for practice' and the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures'.

To ensure trustworthiness, swift and wide adoption by user communities, and to support EU and national policymakers, actions should adopt high standards of transparency and openness, going beyond ex-post documentation of results and extending to aspects such as assumptions, benchmarks, models and data quality during the life of projects.

Concrete efforts shall be made to ensure that the data produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide "FAIR-by-design" data, i.e., data that is FAIR from its generation.

HORIZON-CL6-2024-FARM2FORK-02-2-two-stage: Sustainable organic food innovation labs: reinforcing the entire value chain

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 11.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: By producing high quality food with low environmental impact, organic farming plays an essential role in developing sustainable food systems in the EU, an objective that is at the heart of the European Green Deal. Under the European Green Deal’s farm to fork and biodiversity strategies, the European Commission has set a target of ‘at least 25% of the EU’s agricultural land under organic farming by 2030 and a significant increase in organic aquaculture’. To achieve this target and to help the organic sector reach its full potential, the Commission has put forward a new action plan for the development of organic production in the EU²⁰⁸.

In 2020, 9,1% of the total EU’s agricultural land was under organic production. This number hides substantial differences between Member States as regards the share of agricultural land dedicated to organic farming: from 0.5% to more than 25%. These differences are partially due to the lack of structures adequate for organic farm products in some countries. In line with the EU action plan for the development of organic production, the successful proposals will support the establishment of adequate structures that enable the proper channelling of organic production in supply chains allowing farmers to fully benefit from the added value of organic production.

Project results are expected to contribute to all of the following expected outcomes:

²⁰⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>

- Reinforced local and small-volume processing of organic food;
- Boosted innovative sustainable packaging solutions resulting in reduced waste (in particular of non-renewable and fossil derived plastics);
- Fostered innovative supply and distribution models and short trade circuits;
- Added value to organic agricultural products, improved organic farmers' incomes and their positioning in agri-food value chains;
- Enhanced market orientation and capacity of organic farmers and small and medium scale processors to meet consumer demand for sustainable and healthy diets based on organic food;
- Increased availability, affordability and accessibility of organic food with positive impacts on sustainability, including on biodiversity, on climate, ecosystems services and public health.

Scope: Organic farming has developed mainly at the primary production level, while the processing of organic farm products is less developed and regulated. Besides, the organic sector is characterised by its scattered nature, with imbalances in the food value chains limiting the bargaining power of organic farmers and producers still having access to a limited number of processors and retailers. Therefore, investing in innovative careful processing techniques and sustainable and reusable packaging, streamlining the distribution and logistics of organic produce and agricultural input networks, and achieving a better understanding of quality and safety issues in organic supply chains, in combination with regulations, is important for creating new value for consumers.

This will enable small organic producers, in particular those located in remote areas, to find an outlet for their production and benefit from the added value of their organic certification. However, operators are often reluctant to convert to organics due to the lack of organised and efficient organic commercial supply chains. In addition to the cross-cutting problems faced by agri-food supply chains, organic distribution can entail high operating costs and an imbalance between supply and demand. Exchanging experience and knowledge can encourage the creation of local food markets and short supply chains, and uphold the integrity of the organic quality of the product.

Proposals should establish and animate locally-driven, multi-actor organic food innovation hubs, bringing together researchers, innovators, farmers, processors and others, to:

- Develop, test and pilot innovations in organic small-scale food processing, in particular careful processing, and new, sustainable and reusable packaging (avoiding non-renewable and fossil-derived plastics), optimising the preservation of nutritional quality, reducing perishability and ensuring food safety;
- Foster diverse innovative solutions/approaches that are tailored to the needs of farmers and SMEs, while ensuring links between food processing and primary production, and

adapted to the seasonal character of raw material production and processing in small(er) batches;

- Develop and explore innovative supply and distribution models (including business models, market outlets and marketing strategies, short trade circuits, public procurement, food services), that are adapted to proposed innovative solutions;
- Assess the impacts of the innovative solutions on sustainability (climate, environmental, social, including health, and economic);
- Build a community of practice to share learnings, build capacity and support adoption of innovations at scale.

Proposals should cover a range of crops (indoor and outdoor), both arable and perennial, representative of the organic sector in Europe, as well as the organic livestock sector.

Projects must use the 'multi-actor approach', ensuring adequate involvement of all relevant actors, including farmers and SMEs. Proposals may build on existing research infrastructures, where relevant. Proposals are encouraged to build on past and ongoing EU-funded research and innovation projects, and are strongly encouraged to cluster with ongoing and upcoming projects. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, in particular the topic in this Work Programme HORIZON-CL6-2023-GOVERNANCE-01-20: Developing an EU advisory network on organic agriculture' and the future partnerships 'Accelerating farming systems transition: agroecology living labs and research infrastructures' and 'Sustainable food systems for people, planet and climate'.

HORIZON-CL6-2024-FARM2FORK-02-3-two-stage: Tools to increase the effectiveness of EU import controls for plant health

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage

	application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will support the farm to fork strategy for a transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the objective to reduce the use and risk of chemical pesticides by 2030. Activities will support Regulation (EU) 2016/2031²⁰⁹ on protective measures against pests of plants.

Project results are expected to contribute to all of the following expected outcomes:

- Enlarged availability and accessibility to cost-efficient and user-friendly tools and methods for the detection of plant pests to assist plant health inspectors during import controls;
- Increased the effectiveness of detection of plant pests at import points, by decreasing time and overall costs;
- Knowledge exchange and uptake of the innovative tools are promoted;
- Support plant health inspections and import controls.

Scope: Plant health is of global importance for agriculture, forestry, natural ecosystems, ecosystem services and biodiversity. Plant health is threatened by species injurious to plants and plant products, which now present a greater risk of being introduced into the Union territory owing to globalisation of trade and climate change. The current EU plant health legislative landscape aims at a proactive approach ensuring safe trade and mitigating the impacts of climate change on the health of the crops and forests in Europe.

Research activities should support these measures by contributing to the development of more rapid, reliable and economic innovative solutions and devices that can assist plant health inspectors at the borders. Technologies such as e-noses, acoustic devices, scanners, and

²⁰⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031>

portable devices for molecular identification of plant pests²¹⁰ within hours/minutes of the specimen's sampling often using limited amounts of plant or plant product material, and other relevant solutions, are included within the scope of this topic.

Proposals should:

- Deliver more rapid, robust, and innovative solutions appropriate for detecting and identifying plant pests during import controls;
- Make use of innovative technologies for the detection of a broader spectrum of plant pests;
- Prove cost-benefits of the innovative solutions;
- Promote a wider use of new detection technologies for plant health diagnostics.

Proposals must implement the 'multi-actor approach' including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services, industry including SMEs are brought together. Proposals should take due account of dissemination to relevant stakeholders to facilitate the uptake of results.

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics, e.g., by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-FARM2FORK-02-4-two-stage: Tackling outbreaks of plant pests

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 13.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see

²¹⁰ A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

	General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply: The proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<i>Procedure</i>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.</p>

Expected Outcome: A successful proposal should support the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, notably the target to reduce by 50% the overall use and risk of chemical pesticides and reduce the use by 50% of the more hazardous pesticides. Activities will support Regulation (EU) 2016/2031²¹¹ on protective measures against pests of plants.

Project results are expected to contribute to all of the following expected outcomes:

- Find adequate responses for EU quarantine plant pests;
- Enhance capacities to prevent, monitor and (bio)control plant pests following under the scope of this topic;
- Support to relevant EU and Associated Countries' plant health policies.

Scope: Plant health is of global importance for agriculture, forestry, natural ecosystems, ecosystem services and biodiversity. Plant health is threatened by species injurious to plants and plant products, which present a greater risk of being introduced into the Union territory due to globalisation, trade and climate change. The current EU Plant Health legislative landscape helps protect the EU against the introduction of new plant pests as well as tackling existing plant pests more effectively. The prevention of entry and, if arrived within the EU territory, early detection and eradication are part of the plant health policies to avoid significant impacts in agriculture, forestry and environment by plant pests.

²¹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031>

Proposals should target one or more plant pest(s)²¹² that are either Union quarantine plant pests²¹³ present in the EU or Union quarantine pests which are priority pests²¹⁴ in the EU, and that are of concern for agriculture and/or forestry²¹⁵, with the exception of plant pests targeted in Horizon Europe²¹⁶. Research activities should improve methods for an effective implementation of the principles of integrated pest management (IPM), whilst reflecting the move towards innovative biological and other non-chemical control and resistance breeding.

Proposals should:

- Contribute to the understanding of the drivers of plant pest introduction, spread and establishment including the biology of the pest and its interaction with host plants and antagonists, the influence of climate change, ecosystem degradation, and globalisation;
- Develop efficient surveillance methods and strategies for early-detection and (bio)control of the pest(s);
- Extend the range of tools and technologies available for the development of economically and environmentally sound solutions for an effective pest prevention and outbreak management, and if relevant pursue in line with the principles of integrated pest management and taking into account the use of non-chemical or biological control methods;
- Analyse the social and economic implications for farmers, foresters and other economic operators affected by the outbreaks of the plant pest(s) and developing approaches whereby those affected can best cope with the situation;
- If relevant, analyse the ecological impact of plant pest(s) spread and establishment based on the experience obtained from existing outbreaks.

International cooperation with countries affected or threatened by the same pest(s) is strongly encouraged in particular to capitalise on existing knowledge. Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services, farming/forestry sectors, advisory services, and industry are brought together. Results of activities should benefit both conventional and organic farming.

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics²¹⁷, for example by undertaking joint activities, workshops or

²¹² A pest is defined here as any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products (EU legislation, Regulation 2016/2031)

²¹³ See part B of Annex II to Commission Implementing Regulation 2019/2072 for pests known to occur in the Union territory

²¹⁴ See Annex to Commission Delegated Regulation (EU) 2019/1702 for priority pests.

²¹⁵ Applicants are expected to explain and justify the choice.

²¹⁶ Plant pests of the topic HORIZON-CL6-2021-FARM2FORK-01-04: Tackling outbreaks of plant pests

²¹⁷ For example, HORIZON-CL6-2023-GOVERNANCE-01-16: Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures and HORIZON-CL6-2024-

common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

The possible participation of the JRC in the project will consist of supporting the analysis of social and economic implications for farmers, foresters and other economic operators affected by the plant pest(s) and developing approaches whereby those affected can best cope with the situation.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-FARM2FORK-02-5-two-stage: Animal nutritional requirements and nutritional value of feed under different production management conditions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will support the objective of the farm to fork strategy to transition to a fair, healthy and environmentally-friendly European agriculture, and contribute to strengthen the resilience and sustainability of specific farming sectors and preserve biodiversity. It is expected to contribute to limit the reliance of the European agricultural sector to imported feed materials.

The proposed project will enhance the use of locally produced and more climate-friendly solutions for animal feed without compromising animal performance and productivity. It will focus on existing or alternative source of nutrients using value chain approaches to maximize feed production and feed use efficiency, supporting the local environment and farm circularity.

Activities under this topic will contribute to all of the following expected outcomes:

- Guidelines for processes and policies for improved resource-efficient production, use, and diversification of safe feedstuffs;
- Optimised use of feedstuffs, new plants, forage species and associations at local level;
- Uptake by farmers of practices to diversify sources of feedstuffs and use of natural resources on rangeland, where appropriate;
- (Alternative) Feed production/supply strategies that facilitate self-sufficiency and ensure safety of feed; closed nutrient cycle at local level and diminished environmental and climate footprint;
- Improved systems for facilitating the planning and calculation of the rations/diets of feed adjusted to specific livestock and individual/group animal requirements, and for mitigating the risk of anti-nutritional factors or contaminants in feedstuffs.

Scope: Feed resources are important components of livestock production systems, and their efficient use is the primary determinant of animal performance and productivity. The availability and use of local feedstuffs, including new and underused sources, including alternative protein sources, is a challenge in many livestock farming systems and it has several implications in terms of farm economics, product quality and safety, animal health and welfare. Furthermore, there is the need to design more precise and resilient feeding systems while ensuring requirements of biodiversity protection and restoration.

The aim is to optimise the use of local feedstuffs, shorten supply chains and rely more on local resources. It is important to investigate content, availability and digestibility of nutrients in locally available feedstuffs in different pedo-climatic regions and livestock systems, without compromising feed safety and efficiency.

The following elements should be incorporated:

- Determine and adjust net energy-based nutritional requirements (macro and micronutrients) for local breeds and different management conditions, addressing both conventional and organic livestock farming;
- Assess on-farm practices and equipment to use feedstuffs more efficiently (post-harvest technologies, crops mixture, foraging strategies, rangeland management);
- Take advantage of between and within breed genetic diversity to optimize the use (acceptance and feed efficiency) of local feedstuffs;

- Evaluate the impacts of processing technologies on the efficiency of local feedstuffs
- Improved knowledge on the effects of functional additives (enzymes, gut flora stabilisers, natural plants, vitamins, etc.) on farm-scale animal performance, health and welfare;
- Assess and minimize the risk of anti-nutritional factors or contaminants such as biotoxins in feedstuffs,
- Analyse and monitor the performance of the animal production systems and the quality of animal-based products under novel feeding strategies;
- Determine better indicators of animal nutritional requirements and the nutritional value of locally produced feedstuffs
- Assess the economic sustainability and environmental impact of identified resilient feeding systems and related structural changes (at local level)

If necessary, proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under other topics and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe.

Due to the scope of this topic, international cooperation is strongly encouraged, in particular with China. This topic is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

Actions will contribute to implementing the EU-China Food, Agriculture and Biotechnology (FAB) flagship initiative, which aims to ensure sustainability of agri-food systems, catering for the needs of a growing population, the reduction of food and agricultural losses and waste, and the provision of safe and healthy foodstuffs. Interaction with other actions developed under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and the Flagship on Food, Agriculture and Biotechnologies (FAB) is encouraged if relevant.

Enabling sustainable fisheries and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-FARM2FORK-02-6-two-stage: Minimising climate impact on fisheries: mitigation and adaptation solutions for future climate regimes

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately.

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Selected proposals are expected to contribute to all the following outcomes:

- Contribution to sustainable fisheries for fair, healthy, climate-resilient and environment-friendly food systems with low impact on aquatic ecosystems, supporting the EU common fisheries policy, the European Green Deal and in particular the EU biodiversity strategy for 2030 and the farm to fork strategy;
- Transformation of fisheries to make a significant contribution to climate-neutrality;
- Contribution to more precise, technologically advanced data collection (notably through the use of techniques such as artificial intelligence, sensors and robotics) which encompasses the natural and social ecosystem context;
- Understanding of the resilience potential to climate change of exploited resources and build up the adaptive capacity for fisheries management;
- Preparation of the seafood sector to seize opportunities to harvest shifting stocks in the most sustainable manner, taking into account environmental, social and economic considerations.

Scope: Proposals are expected to investigate the impacts of climate change on biological and ecological processes such as shifts in stocks distribution, abundance and density, fish health, stock productivity, habitats, regime shifts in ecosystems and altered growth, reproduction rates, seafood safety and overall changes in the ecosystem potential production. They should also explore and test innovative measures to mitigate climate change (such as new designs of fishing gears or new fishing strategies that do not resuspend carbon from the seabed or new fishing strategies which improve energy use efficiency or strengthen circularity aspects) and adaptive solutions (such as valorisation of new catches or building resilience actions).

Proposals should include studies representing the whole spectrum of European fisheries, including small-scale fisheries, and the related biotic, abiotic, social and economic conditions. They should follow an interdisciplinary approach and cover both scientific and socioeconomic aspects.

They should build on the work of Horizon 2020 projects ClimeFish and CERES and others and provide applicable approaches and tools to the fishing sector. They should also build on the work of initiatives such as the EMFF-funded studies on “*Climate change and the Common Fisheries Policy: adaptation and building resilience to the effects of climate change on fisheries and reducing emissions of greenhouse gases from fishing*”, and “*Adapting postharvest activities in the value chain of fisheries and aquaculture to the effects of climate change and mitigating their climate footprint through the reduction of greenhouse gases emissions*”.

Also importantly, proposals should build synergies with the projects funded under the topics HORIZON-CL6-2023-BIODIV-01-5: Understanding and reducing bycatch of protected species in Destination “Biodiversity and ecosystem services” and ‘HORIZON-CL6-2022-CLIMATE-01-02: Understanding the oceanic carbon cycle’ as well as with work done under other organisations such as the OECD Committee for Fisheries. Selected proposals should collaborate with each other.

Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The possible participation of the JRC in the project would consist in providing and analysing fisheries.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-FARM2FORK-02-7-two-stage: Minimising climate impact on aquaculture: mitigation and adaptation solutions for future climate regimes

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Selected proposals are expected to contribute to all of the following expected outcomes:

- Contribution to sustainable aquaculture systems (in marine and/or transitional, and/or fresh waters) for fair, safe, healthy, climate-resilient and environment-friendly food systems with low impact on aquatic ecosystems, supporting the European Green Deal and the farm to fork strategy, the “*Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030*”²¹⁸, and the “*Action plan for the development of organic production*”²¹⁹;
- Implementation of innovations, such as dietary shifts and aspects of circularity, for a more sustainable and competitive European aquaculture enhancing aquaculture resilience to adverse consequences of climate change;
- Positioning of European aquaculture production as the global reference for sustainability and quality, increase its competitiveness, reduce EU dependence on imports of fisheries and aquaculture products and create more jobs, especially in rural and coastal regions;
- Contribution to aquaculture production with a reduced environmental footprint, advancing towards climate-neutrality;

²¹⁸ COM(2021)236 final

²¹⁹ COM(2021)141 final

- Contribution to technologically-advanced aquaculture production (indicatively through the use of techniques such as artificial intelligence, sensors, internet-of-things and robotics), fully embedded in natural, social, ethical and economic sustainability.

Scope: Proposals are expected to enhance knowledge of the impacts of climate change on aquaculture production at environmental, social and economic levels. They should identify, forecast and assess the main effects of climate change on different aquaculture production systems and on their ecological carrying capacity.

They should consider impacts of climate change such as water availability (e.g., rise in evaporation, decrease in rainfall, extreme weather events like droughts or floods), water quality (e.g., acidification, eutrophication, pollution, contamination), temperature rise, sea level rise, spread of diseases (e.g. recrudescence of endemic and emerging diseases in traditional and recirculating aquaculture systems), reduced fish welfare, invasive species, and other climate related risks.

They should also investigate adaptation and mitigation solutions and opportunities such as technological, social, economic, and biological/ecological aspects, selection of suitable sites, culture methods (including the contribution of organic production and integrated multi-trophic aquaculture), species plasticity and adaptability to changing environments as well as breeding and selection techniques for a more sustainable, productive and resilient production.

Furthermore, they should address aspects of circularity in terms of more efficient use of resources and less negative impacts on marine environment, including reduction, valorisation, and reuse of waste. Indicative aspects could include Life Cycle Assessment approaches such as of feeding systems and valorisation of non-food biomass for feeds and fertilisers.

Proposals should build on the work of Horizon 2020 and EMFF projects, such as ClimeFish and CERES, and provide applicable approaches and tools to the aquaculture sector.

Selected proposals should collaborate with each other.

This topic should involve the effective contribution of SSH disciplines.

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The possible participation of the JRC in the project would consist in providing and analysing aquaculture data.

Destination - Circular economy and bioeconomy sectors

This destination and its topics target climate-neutrality, zero pollution²²⁰, fair and just circular and bioeconomy transitions²²¹. These cover safe, integrated circular solutions at territorial and sectoral levels, for important material flows and product value chains, such as i) textiles, ii) electronics, iii) chemicals, iv) packaging, v) tourism, vi) plastics and construction, and vii) key bioeconomy sectors such as a) sustainable bio-based systems²²², b) sustainable forestry, c) small-scale rural bio-based solutions, d) environmental services and e) aquatic (including marine and freshwater) value chains²²³.

The destination supports the European Green Deal, and in particular:

- the new EU Circular Economy Action Plan (CEAP), adopted in March 2020, and the subsequent initiatives along the entire life cycle of products²²⁴;
- the EU strategy on adaptation to climate change adopted in February 2021²²⁵;
- the EU zero pollution action plan²²⁶, adopted in May 2021, with the chemicals strategy for sustainability²²⁷ from October 2020 and the new approach for a sustainable blue economy²²⁸ adopted in May 2021;
- the EU forest strategy for 2030²²⁹: research and innovation will be key drivers in achieving the ambitious goals of this strategy;

²²⁰ See also Destination ‘Clean environment and Zero pollution’ of this Cluster.

²²¹ Synergies ensured with Horizon Europe Clusters 4 and 5 (including their European public private partnerships), while Cluster 4 targets the industrial dimension (including digitalisation, circularity and climate-neutrality / low GHGs emissions industry transition, including developing bio-integrated manufacturing). Cluster 5 covers cost-efficient, net zero-GHGs energy systems, centred on renewables (including the R&I needed to reduce CO₂ emissions from the power and energy-intensive industry sectors, such as solutions for capturing, utilising and storage of CO₂ (CCUS), bioenergy/biofuels and other industrial sectors) Cluster 6 covers the research and innovation based on sustainable biological resources (bioeconomy sectors), in particular for new sustainable feedstock development and valorisation through the development of integrated bio-refineries).

²²² In synergy and complementarity with the EU public-private partnership for a ‘Circular Bio-based Europe’ (CBE JU), (especially as related to the size of actions – IAs and RIAs, and Technology Readiness Level and the industrial-focus of activities, with the first CBE calls expected in 2022).

²²³ In synergy and complementarity with the EU partnership for a climate-neutral, sustainable and productive blue economy and with the EU mission ‘Restore our Ocean and Waters by 2030’.

²²⁴ It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the economy for as long as possible. This plan also aims to ensure that the circular economy works for people, regions and cities, fully contributes to climate-neutrality, zero pollution and resource use decoupling and harnesses the potential of research, innovation and digitalisation

²²⁵ [COM\(2021\)82](#) final “Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate”.

²²⁶ [COM\(2021\)400](#) final ‘Pathway to a Healthy Planet for All EU Action Plan: “Towards Zero Pollution for Air, Water and Soil’.

²²⁷ [COM\(2020\) 667](#) final ‘Chemicals Strategy for Sustainability Towards a Toxic-Free Environment’.

²²⁸ [COM\(2021\)240](#) final ‘On a new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future’.

²²⁹ [COM\(2021\)572](#) final ‘New EU Forest Strategy for 2030’.

- the EU climate law targeting climate-neutrality by 2050 and AFOLU²³⁰ climate-neutrality by 2035, which supports increased focus on bio-based circular consumption, as part of the Fit for 55 package proposed on 14 July 2021²³¹;
- the new European Bauhaus initiative²³² and the renovation wave²³³.

Furthermore, the Horizon Europe work programme for 2023-2024 will play a critical role in implementing the EU strategy for sustainable textiles²³⁴, which highlights the strategic role Horizon Europe initiatives play in R&I in the textile ecosystem. Textiles are the fourth highest category as regards pressure on the use of primary raw materials and water and fifth for GHG emissions, and are a major source of microplastic pollution in production and use phases. They are also a key material and product stream in the circular economy action plan. Improvements in the circularity of the textile value chains will help reduce GHG emissions and environmental pressure. The framework is established in the strategy for sustainable textiles, The transition pathway is a multistakeholder process, that could support implementation Attention should be paid to ensuring a circular, safe and sustainable design and the use of new sustainable biobased materials, as well as to collection, sorting and upcycling. Automated processes and digital solutions should help increase reuse and recycling. The safe-and sustainable-by-design concept aligns circular, safety and bioeconomy approaches with zero pollution. R&I can link various EU policies, namely those related to the green and digital transition, resilience and competitiveness. Under the proposed Ecodesign Sustainable Product Regulation (SPI)²³⁵ the Commission will set out ecodesign requirements on design in order to reduce the environmental footprint of products, striving for products to be kept in circular use for as long as possible.

The wide range of EU initiatives supported by this destination includes:

- the industrial strategy;
- the EU chemicals strategy for sustainability;
- the SME strategy;
- the revised (2018) bioeconomy strategy²³⁶ and its action plan;

²³⁰ AFOLU: “Agriculture, Forestry and Other Land Use”.

²³¹ [COM\(2021\)550](#) final “Fit for 55: delivering the EU's 2030 Climate Target on the way to climate neutrality”.

²³² [COM\(2021\)573](#) final “New European Bauhaus Beautiful, Sustainable, Together”.

²³³ [COM\(2020\)662](#) final “A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives”.

²³⁴ [COM\(2022\)141](#) final “EU Strategy for Sustainable and Circular Textiles”.

²³⁵ [COM\(2022\)142](#) final Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC .

²³⁶ European Commission, Directorate-General for Research and Innovation, European bioeconomy policy: stocktaking and future developments: report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2777/997651>.

- the communication on sustainable carbon cycles;
- the sustainable blue economy approach and its offshoot initiatives;
- the EU biodiversity strategy for 2030;
- the farm to fork strategy;
- the upcoming EU agenda for tourism;
- the plastics strategy and the action plan on critical raw materials.

In addition, this destination will contribute to the transition pathways of energy-intensive industries, textiles, construction and agri-food industrial ecosystems.

Where appropriate, proposals are encouraged to cooperate with the European Commission Knowledge Centre for Bioeconomy, also for the purpose of dissemination and exploitation of results.

Expected impact

Proposals for topics under this destination should set out a credible pathway to:

- develop the circular economy and bioeconomy sectors;
- ensure natural resources are used and managed in sustainable and circular manner;
- prevent and remove pollution;
- unlock the full potential and benefits of the circular economy and the bioeconomy, with clean secondary raw materials, ensuring competitiveness and guaranteeing healthy soil, air, fresh and marine water for all, through better understanding of planetary boundaries and wide deployment and market uptake of innovative technologies and other solutions, notably in primary production (forestry) and bio-based systems.

More specifically, the proposed topics should contribute to one or more of the following impacts:

- **Regional, rural, local/urban and consumer-based transitions are accelerated** towards a sustainable, regenerative, inclusive, just and clean circular economy and bioeconomy across all regions of Europe. Special attention should be paid to the most sensitive/vulnerable ²³⁷ and greenhouse gas-intensive regions, based on **better knowledge and understanding of science**, and improved capacity to design, implement and monitor policies and instruments for circular and bio-based transitions.

²³⁷ Taking into account all aspects of sustainability, i.e. social, economic and environmental, and in particular sensitivity/vulnerability to the effects of the climate change, as well as due to the current social dependency on fossil resources, especially in remote, rural and low-income regions and cities.

- **European industrial sustainability, competitiveness and resource independence are strengthened** by reducing the use of primary non-renewable raw materials and greenhouse gases emissions and other pollutants, achieving an improved environmental footprint (including on biodiversity), enabling climate-neutrality, zero pollution²³⁸ and higher resource efficiency. This will also be supported by increasing circular and bio-based practices in textiles, plastics, electronics and construction, developing further on industrial symbiosis as well as circularity and sustainability by design, cascading use of biomass and, clean secondary raw materials, along and across value chains.
- **Innovative and sustainable value-chains are developed in the bio-based sectors** replacing fossil-based value chains, increasing circular bio-based systems from sustainably sourced biological resources, and replacing carbon-intensive and fossil-based systems. Such a development will be supported through R&I in **biotechnology** and other enabling technologies, which is a prerequisite and driver of future solutions for a circular economy and the bioeconomy transition. This will involve with inclusive engagement with all stakeholders, including policymakers and will increase access to finance and technical support along whole supply chains for bioeconomy projects.
- **The benefit for consumers and citizens, including those in rural areas, are improved** by establishing circular and bio-based systems based on sustainability, inclusiveness, zero pollution²³⁹, health and safety. All value chain actors (manufacturers, retailers, service industry, consumers, public administration, including on regional level, primary biomass producers etc.) are involved to a significantly higher degree.
- **Multi-functionality and management of forests in Europe are safeguarded** based on the three pillars of sustainability (economic, environmental and social), in particular to optimise the contribution of forests and the forest-based sector in mitigating and adapting to climate change.
- **Potential of marine and freshwater biological resources and blue biotechnology is enlarged** to i) deliver greener (climate-neutral and circular) industrial products and processes, ii) help characterise, monitor and sustain the health of aquatic ecosystems for a healthy planet and people, and iii) help in the drafting of proposals for accompanying changes in regulation where necessary.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023-CIRCBIO-01	98.50		28 Mar 2023

²³⁸ See also Destination 4 ‘Clean environment and Zero pollution’ of this Cluster.

²³⁹ See also Destination 4 ‘Clean environment and Zero pollution’ of this Cluster.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

HORIZON-CL6-2023-CIRCBIO-02	80.00		28 Mar 2023 (First Stage) 26 Sep 2023 (Second Stage)
HORIZON-CL6-2024-CIRCBIO-01		74.50	22 Feb 2024
HORIZON-CL6-2024-CIRCBIO-02		73.00	22 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)
Overall indicative budget	178.50	147.50	

Call - Circular economy and bioeconomy sectors

HORIZON-CL6-2023-CIRCBIO-01

Conditions for the Call

Indicative budget(s)²⁴⁰

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ²⁴¹	Indicative number of projects expected to be funded
		2023		
Opening: 22 Dec 2022 Deadline(s): 28 Mar 2023				
HORIZON-CL6-2023-CircBio-01-1	CSA	2.50	Around 2.50	1
HORIZON-CL6-2023-CircBio-01-10	CSA	2.00	Around 2.00	1
HORIZON-CL6-2023-CircBio-01-11	RIA	8.00	Around 4.00	2
HORIZON-CL6-2023-CircBio-01-12	RIA	12.00	Around 6.00	2
HORIZON-CL6-2023-CircBio-01-13	RIA	12.00	Around 6.00	2
HORIZON-CL6-2023-CircBio-01-14	RIA	4.00	Around 4.00	1
HORIZON-CL6-2023-CircBio-01-2	IA	18.00	Around 6.00	3
HORIZON-CL6-2023-CircBio-01-3	CSA	2.00	Around 2.00	1
HORIZON-CL6-2023-CircBio-01-4	RIA	4.00	Around 4.00	1
HORIZON-CL6-2023-CircBio-01-5	IA	10.00	Around 5.00	2
HORIZON-CL6-2023-CircBio-01-6	CSA	3.00	Around 1.50	2

²⁴⁰ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

²⁴¹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

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HORIZON-CL6-2023-CircBio-01-7	CSA	3.00	Around 1.50	2
HORIZON-CL6-2023-CircBio-01-8	IA	10.00	Around 5.00	2
HORIZON-CL6-2023-CircBio-01-9	RIA	8.00	Around 4.00	2
Overall indicative budget		98.50		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling a circular economy transition

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-01-1: Enhancing collaboration between Circular Cities and Regions Initiative's (CCRI) supporting organisations

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.50 million.

<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply:</p> <p>Proposals funded under this topic must form part of the instruments for the implementation of the European Commission’s Circular Cities and Regions Initiative (CCRI). This means that:</p> <ul style="list-style-type: none"> • Proposals must cooperate with CCRI and its Coordination and Support Office (CCRI-CSO) by means of sharing with this initiative knowledge and experiences gained through the implementation of the CSA, as well as participating in the CCRI’s main events (e.g. general conferences and coordination meetings). • Proposals must ensure the proposed activities are complementary to those of the CCRI Coordination and Support Office. • Proposals must clearly specify how the CSA will ensure synergies and complementarities with other circular economy projects and initiatives (incl. those recognised as CCRI projects and CCRI Associated Partners). <p>Applicants must integrate explicitly these obligations into their proposal’s work plan.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).²⁴².</p>

Expected Outcome: Successful proposal will support the delivery of solutions to implement the European Green Deal, the EU circular economy action plan (CEAP) and the EU bioeconomy strategy. The topic will support the transition towards a sustainable, regenerative, inclusive and just circular economy at local and regional scale across the EU and Associated Countries.

Proposals results are expected to contribute to all of the following expected outcomes:

²⁴² This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Strengthened collaboration and complementarity between various relevant initiatives and organisations that support circular economy at the local and regional scale;
- Enhanced support to the implementation of circular systemic solutions in cities and regions through the streamlining and creation of synergies with/between the activities of other relevant initiatives and organisations;
- Increased capacity, efficiency and efficacy of organisations that support circular economy at the local and regional scale, e.g. research and technology organisations, associations of cities and regions, other support organisations providing technical assistance to urban and regional circular economy initiatives and projects;
- Enhanced knowledge transfer and exchange of best practices between organisations that support circular economy at the local and regional scale;
- More widespread dissemination of circular innovation, including technological, business, governance and social innovation, which lead to an uptake and easier replication, scalability and visibility of circular systemic solutions and hence multiplication of their economic, social and environmental benefits at the local and regional scale;
- Increased contribution of the Circular Cities and Regions Initiative (CCRI) scheme to the policy targets of the European Green Deal, particularly the circular economy action plan, the industrial strategy and the bioeconomy strategy at local, regional, national, European and international levels.

Scope: As part of the EU circular economy action plan, the Circular Cities and Regions Initiative (CCRI)²⁴³ supports the implementation of circular systemic solutions at the local and regional levels by providing financial and technical assistance to cities and regions in the EU and Associated Countries. The CCRI Coordination and Support Office (CCRI-CSO) is responsible for facilitating the implementation of the CCRI and supporting the cooperation, synergies and complementarities between the CCRI Pilot Group and Fellows, CCRI Projects and Associated Partners. In particular, the CCRI-CSO is responsible for providing practical and tailor-made support to the Pilot Group. The CCRI-CSO also helps to identify and analyse the main R&I gaps as well as the (technical, regulatory and financial) barriers and drivers to a local circular economy.

There is a wide range of organisations in Europe that focus on circular economy at the local and regional scale and have the potential to contribute to CCRI, by implementing activities ranging from political engagement, networking, dissemination, research, support to the development and implementation of circular economy action plans and other circular innovative solutions on the ground.

²⁴³ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/circular-cities-and-regions-initiative_en.

The objective of this topic is to strengthen the collaboration between various relevant initiatives and organisations that support circular economy at the local and regional scale, enhance their capacity to contribute to CCRI, while avoiding overlaps and duplications in their activities. Proposals should build on the activities of the CCRI-CSO, and ensure the proposed activities are complementary. Proposals should set out a clear plan on how they plan to collaborate with the CCRI-CSO, CCRI Pilots and Fellows, CCRI Projects and Associated Partners, for example by undertaking joint activities, workshops or common communication and dissemination activities and/or providing additional technical expertise through dedicated support activities. Selected proposal will thus need to work together with the above-mentioned CCRI counterparts and, if needed, refine their work plan together with the Commission. All the proposals' activities must be coordinated and implemented in close cooperation and coordination with the CCRI-CSO, as well as explore the possibilities to further build on and make use of outputs produced, in order to ensure complementarities.

Proposals should:

- Ensure close cooperation with CCRI and its Coordination and Support Office (CSO), and contribute to CCRI's goals and activities, for instance by participating in relevant activities and sharing knowledge that can be transferred to the Pilot Group and Fellows and beyond;
- In cooperation with the CCRI-CSO, facilitate exchange of knowledge and best practices on circular economy innovation, including innovative technologies, business models and governance as well as methodologies for supporting local and regional initiatives based on the latest knowledge in management, behavioural science and other relevant areas;
- In collaboration with the CCRI-CSO, provide technical support to local and regional circular economy initiatives in order to increase the chance of success of circular systemic solutions. The projects should complement the support provided by CCRI-CSO to Pilot Group and Fellows, either by targeting cities and regions not already included in the list of CCRI Pilot Group and Fellows supported by the CSO and/or covering additional circular economy topics and dimensions not already addressed by the CCRI-CSO;
- Organise workshops, webinars, trainings, capacity-building and/or peer-learning activities in coordination with the CCRI-CSO, in order to support the development and implementation of circular systemic solutions as well as facilitate knowledge and experience transfer for further outreach and replication in European territories;
- Develop in cooperation with the CCRI-CSO relevant case studies of local and regional circular economy measures, activities and policies, identifying and presenting the respective strengths and weaknesses. These case studies could be used for their replication and dissemination across the EU and Associated Countries;
- Support the CCRI-CSO in the development of guidance and policy recommendations for local and regional authorities on how to address identified technical, regulatory, and

financial obstacles to the transition to the circular economy as well as on the development and the implementation of circular economy initiatives at a local and regional scale;

- Promote in collaboration with the CCRI-CSO the concept of circular economy to cities and regions that are in the early stage of circular economy transition to help them build their understanding of the concept and the opportunities and chances of a circular system.

The target group of this topic includes organisations that support circular economy at the local and regional scale. These may include: research and technology organisations, associations of cities and regions, other organisations providing technical assistance to local and regional circular economy initiatives and projects. Proposals should ensure that all evidence, information and project outcomes will be accessible through the CCRI website.

Among other entities, organisations that have already received funding from Horizon 2020 or Horizon Europe under CCRI demonstration and project development assistance topics (LC-GD-3-2-2020; HORIZON-CL6-2021-CIRCBIO-01-01; HORIZON-CL6-2021-CIRCBIO-01-02) and/or are currently officially one of the CCRI Associated Partners can be eligible for this topic.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CircBio-01-2: One hundred circular model households: making European households sustainable through inclusive circular practices

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 18.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) accelerate regional, rural, local/urban and consumer-based transitions, and ii) improve on consumer and citizen benefits.

Project results are expected to contribute to all the following outcomes:

- Significant, well-documented increase in material efficiency in participating households;

- Significant reduction of emissions of GHG and other pollutants, including micro- and nanoplastic fibres from covered households, and increase of carbon removals;
- Improvement of living conditions in participating households;
- Multiplier effect regarding the replication of the approach and its benefits; leading by example;
- Lessons learnt for a European rollout strategy and integration with sectoral strategies such as Circular Cities and Regions Initiative (CCRI).

Scope: The transition from a take-make-waste society to sustainability, resource-efficiency and circularity will have to happen on the ground in the living environment, i.e. at the consumers' homes, or it will not happen at all. We therefore should reduce the environmental footprint of households, and think about an ambitious GHG reduction target for households that could be tested at large scale via research and innovation funding. Areas to be addressed are e.g., household electronics, textiles, food, packaging and the respective waste, furniture, housing, modes of consumption in general, at the level of individual behavioural decisions. The feasibility of this approach should be demonstrated in pilots with NGOs and CSOs that directly target transformation in a certain number of individual households.

Although technology can contribute, the overall goal can only be achieved through behavioural change. Social and gender aspects are relevant. Proposals should demonstrate how sustainable products and/or services can better meet the real needs of citizens with regard to entertainment, communication, mobility, housing, etc., and how in return this will positively influence consumer behaviour.

This initiative complements the envisaged circular and biobased transition activities in cities and regions at a micro level, as it aims to target individual households. In this way, it will also target social disparity. It will experiment with different behavioural approaches in a scheme of 100 circular households. This R&I initiative will also support the Commission's commitment in the 2020 circular economy action plan (CEAP) to present measures to make circularity work for people, regions and cities, to develop a sustainable product policy framework, to empower consumers and public buyers, and to focus on areas where the potential for circularity is high.

Through this initiative, a cost-free circular economy advisory service shall be provided to selected households. As a first step, all available knowledge on the measurement and calculation of greenhouse gas emissions and other environmental impacts from households, with particular attention to the above-mentioned consumption areas, will be screened and consolidated. A simple and robust method for a quick comparison of environmental impacts, using in particular PEF expertise, will be established.

Proposals shall define the exact scope of demonstration projects, e.g., to transform X households in Y Member States into model circularity/sustainability cells, with a focus on a limited number of material flows, and set reduction benchmarks that are ambitious and

plausible, and that can be validated using the above-mentioned knowledge. In a second step, a support service directly targeted at citizens will be established. Similar to energy advisory services, material efficiency advisors will contact households and identify individual needs and optimisation potential. This can build on the infrastructure of the upcoming Circular Cities and Regions Initiative and other projects that operate at macro level, and on ongoing environmental NGO advisory activities. While the focus is on material flows, trade-offs between material and energy efficiency are to be avoided. All proposed measures have to respect the principles of non-toxicity and zero-pollution. The impact of all measures should be assessed from a lifecycle perspective.

The advisors will be the link between retailers/service providers, insurances etc., where necessary also public services and administration, and households. All proposed measures need to be easy to implement and at least cost-neutral for households. Measures will range from environmentally friendly purchasing, shared product use, swaps to optimised maintenance, upgrade, repair, down to waste disposal. Financing of significant expenses that can be a barrier to transition at household level, and amortisation issues need to be addressed in the context of the advisory service. The aim is also to debunk the notion that sustainable living is a privilege of the wealthy.

In a third step, results will be analysed and presented in a robust way that allows multiplication both through media initiatives and on the ground, via public authorities or directly by individual actors who want to replicate and implement successful circular measures in their remit. With regard to the territorial aspects of all proposed solutions, proposals should seek to contribute to the goals and cooperate with the services of the European Commission’s Circular Cities and Regions Initiative (CCRI)²⁴⁴. Joint activities with CCRI projects are encouraged.

The targeted TRL at the end of the projects is 6 to 8.

HORIZON-CL6-2023-CircBio-01-3: Harnessing the innovation potential and market uptake of successful circular economy water related projects

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant</i>	The rules are described in General Annex G. The following exceptions apply:

²⁴⁴ <https://circular-cities-and-regions.eu/>.

<i>Agreements</i>	Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁴⁵ .
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Expected Outcome: In support of the European Green Deal and EU water-related policies, successful proposals will contribute achieving sustainable and circular management and use of water resources, as well as prevention and removal of pollution, in particular the expected impact of the Destination ‘Circular economy and bioeconomy sectors’ to ‘Accelerate transitions towards a sustainable, regenerative, inclusive, just and clean circular economy based on enhanced knowledge and understanding of science’.

Projects results are expected to contribute to all of the following expected outcomes:

- Boost the uptake of the most promising systemic solutions, innovative recovered products and related business models for sustainable wastewater treatment, recovery and reuse, removing relevant barriers and create a level playing field for innovative companies;
- Change perception and behaviour of European citizens, removing social barriers with regard to wastewater management, recovery and the reuse of resources and energy
- Enhance collaboration and knowledge sharing on water reuse and recovery, education, awareness, and professional skills development;
- Support the implementation of relevant EU policies (e.g., water and marine related policies, water reuse regulation, sludge and industrial emissions directive, climate change adaptation strategy, circular economy action plan, EU bioeconomy strategy and its action plan, EU zero pollution action plan).

Scope: The water sector is facing important transformations in order to ensure resource efficiency, food and water security and meet relevant targets of the EGD. Transitioning to a circular economy and bioeconomy present a big opportunity for that.

Past and ongoing EU funded projects demonstrated the benefits of applying circular economy and bioeconomy principles to water systems and provided interesting case studies on various circular water management approaches and business models, and insights on how materials, water, energy, products and components can be managed in such a way, they can maintain their highest possible intrinsic value. However, the uptake of innovative circular water solutions (e.g., recovered products) is hindered by the lack of a common understanding of

²⁴⁵ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

benefits of systemic solutions and the lack of a systematic analysis of the various, technological, regulatory and social barriers. Raising, for instance, public awareness, stakeholder and business engagement on the use of recovered products (water, nutrients, other resources) is crucial for overcoming social barriers and other regulatory ones as well as for enabling policy developments.

There is therefore the need to create a critical mass for knowledge exchange, to further promote the dissemination and exploitation of EU funded research results, to remove social barriers, facilitate their use by various stakeholders, reduce unnecessary duplication of efforts, ensure/demonstrate public and stakeholders engagement in developing business opportunities of circular use of water and identify wider policy implementation opportunities as well as, opportunities to accelerate and scale-up various scientific and technological advances that support greater water efficiency and reuse in various sectors and promote innovation and business development.

This action should bring together relevant business representatives, investors water utilities, policy makers, researchers, technology providers, water utilities, and other water users and citizens from past and ongoing successful EU funded R&I projects on the circular use of water, to take stock of the outcomes of major results with regards to technologies, eco-innovative solutions and related business models for sustainable treatment and practices of stakeholders and water managers involvement, recovery and reuse of relevant resources from wastewater and sewage sludge (e.g., nutrients, metals, energy, etc.). The involvement of relevant EU water EU associations and supporting platforms should be encouraged, as they play an important role in bringing together different stakeholders (industry, science, regulators, consumers and downstream users) and different sectors (recycling technologies, waste industry, user industries and agriculture) for knowledge transfer, dialogue and confidence building utility associations. The inclusion of relevant SSH expertise would be also needed to help achieving the social related expected outcomes of this action.

For achieving these objectives the action should analyse relevant results and experiences and provide guidance related to the transition pathways that would enable water management authorities and utilities to navigate through water, material and energy pathways. Various business models for future replication, use, policy and market uptake of project results, should be also analysed, as well as related regulatory and/or market barriers. Recommendations for best practices to engaging the public and user industries (such as the food industry for nutrients or the biobased industry for biomasses) in co-design and co-creation processes that can speed up the market uptake of the solutions should be provided, as well as recommendations for future research needs.

The action should:

- Assess how digital business models can further support water reuse, energy and resource recovery along the water cycle and help to increase awareness of the water sector operators concerning the water-energy-carbon nexus and longer-term impact of their day-by-day activity and promote actions for their market uptake.

- Assess the social, environmental and economic impacts of various project results and their contribution the aims of various related EU policies. The full cost of service should be considered within the water sector. This includes the capital and operating expenses, cost savings from recovered products, the environmental and social aspects of water cycle management.
- Propose a roadmap, recommendations and guidance on the standardisation of water products, in relation to secondary raw materials from wastewater treatment plants, including standardized key performance indicators and product certification schemes. In this context it would be also useful to assess to what extent, the development of niche markets and decentralised logistics/business models could further support the market uptake of recovered products.
- Propose a roadmap and action plan to address the social perception and related biases of water reclamation and reuse with a view to increasing awareness among various water users and citizens in general.
- Develop new education and training programmes to upskill young professionals in relevant sectors in relation to the circular use of water along the water cycle.
- Define and propose national and EU-harmonized end-of-waste criteria for the recovered materials.

Innovating for sustainable bio-based systems, biotechnology and the bioeconomy

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-01-4: Land-based bioprospecting and production of bioactive compounds and functional materials for multiple bio-based value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to all Destination ‘Circular economy and bioeconomy sectors’ impacts related to consumers and industry, in particular to development of innovative and sustainable value-chains in the bio-based sectors and of

European industrial sustainability, competitiveness and EU resource independence / strategic autonomy. It will also contribute via research on biotechnology and other enabling technologies, as a prerequisite and driver of future solutions for the bioeconomy transition.

Project results are expected to contribute to all of the following outcomes:

- Enhanced understanding of terrestrial biodiversity and the limits and potentials of its valorisation;
- Addressing the need of sustainable sourcing and development of novel natural, sustainable and ‘eco-friendly’ (including ‘climate-friendly’) materials and product ingredients for various sectors and applications. These will eventually deliver clear-cut benefits for consumers by being more effective and/or eco-friendly, cheaper, better for climate, and more readily accessible than existing fossil-based alternatives;
- Improved sustainable exploitation, cultivation and processing methods based on promising species/organisms (including complex inter-species communities), and chosen production routes; leading to a diminished pressure on the natural resources (especially biodiversity) in situ.
- Increased competitiveness of European biotechnology, in particular the SMEs sector.
- Increased public knowledge and awareness of connections between biodiversity and biotechnology and its potentials, leading to increased trust in the scientific approaches based on informed and robust communication and mutual-learning efforts.

Scope: Global terrestrial biodiversity remains a largely untapped source of natural bioactive molecules and compounds, often combined with interesting potential functional properties of high economic and social value. Such chemical diversity and structural complexity may be matched with biological potency and selectivity. While some of the natural biochemical diversity has been studied²⁴⁶, the potential for developing new applications and products is far from exhausted²⁴⁷. There are still significant opportunities to improve the biodiscovery process as well as understanding of specific biochemical pathways leading to high-value applications, especially with those with a reduced Green House Gas (GHG) emissions, in various sectors, based on novel biochemicals and functional bio-based materials.

This will increase capacity in the European biotechnology sector and other industries to respond to society’s needs. The challenge is to match sustainable sourcing and processing with efficient and cost-effective use. This calls for close cooperation between industrial and academic partners, with due consideration for health/safety and environmental legislation, and informed public engagement.

²⁴⁶ E.g., Horizon 2020 topic FNR-11-2020. Prospecting aquatic and terrestrial natural biological resources for biologically active compounds, ongoing project [InnCoCells](#).

²⁴⁷ European Commission, Directorate-General for Research and Innovation, Wydra, S., Hüsing, B., Aichinger, H., et al, Life and biological sciences and technologies as engines for bio-based innovation, Publications Office, 2021, <https://data.europa.eu/doi/10.2777/046454>.

Activities should address:

- Technical improvements of the bioprospecting of any land-based organisms for potential bioactive compounds and functional materials, based on identified suitable sources of feedstock. The bioprospecting may be “bio-guided” by the study of chemical ecology interspecific interactions (symbiotic/defence) such as, for instance, plant-insects, or microbial-insect/plant/fungus interactions.
- Addressing sustainable biodiscovery, including by advanced detection methods, such as *in silico* database analysis, microfluidics/lab-on-chip, high-throughput screening, machine learning, etc, overcoming the issues of low concentrations of target molecules, and their general scarcity, and use of natural biological resources from diverse terrestrial environments and ecosystems, allowing better assessment of the selected bioactivity/functional property potential.
- Defining and assessing the optimal further production routes via innovative approaches and systems/platforms (e.g., biotechnology, hydroponics, bioreactors), as well as economic feasibility assessment of these options for resulting bioactive compounds and functional materials, ensuring full valorisation of biomass and all by-products in the production routes, and biomass’ sustainable supply, and, if appropriate, proposing an outline of continuation of the end-product development beyond the project timeline and its present resources.
- Assessing and clearly communicating, by inclusive communication and dissemination strategies, the environmental and climate benefits (e.g., by lowering the pressure on the natural habitats (decrease of harvesting *in situ*), supporting nature conservation, and increase overall resource efficiency and sustainability), while expanding the range of natural ingredients for the new applications in industrial sectors.
- Covering the environmental, climate and safety/health impacts of the developed ingredients or processes, using Life-Cycle Assessment (LCA) methodologies based on available standards, certification, and accepted and validated approaches. Estimate of possible negative environmental impacts and trade-offs should be provided. The need to guarantee biodiversity preservation and compliance with relevant international rules on access to biological resources, their sustainable use and the fair and equitable sharing of benefits from their utilisation, with the national regulations in the source countries and with the Convention on Biological Diversity and its Nagoya Protocol.
- Food, biofuel and bioenergy applications are not in scope. Agricultural crop protection products (chemical pesticide substitutes) are also not in scope, to avoid overlaps with a parallel topic²⁴⁸. Marine and aquatic ecosystems are also out of scope to avoid overlap with parallel topics²⁴⁹ and projects funded under the recent call²⁵⁰. For any health-related

²⁴⁸ HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution.

²⁴⁹ Topics under the present Destination, Heading 3 – Innovating for blue bioeconomy and biotechnology value chains.

applications, complementarities with Horizon Europe Cluster 1 ‘Health’ should be carefully explored, to avoid duplications, and seek synergies.

Where relevant, and to increase impact, proposals should seek links and synergies as well as capitalise on the results of past and ongoing research projects²⁵¹ (including under the Bio-based Industries Joint Undertaking (BBI JU) / Circular Bio-based Europe Joint Undertaking (CBE JU)):

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CircBio-01-5: Broadening the spectrum of robust enzymes and microbial hosts in industrial biotechnology

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to Destination ‘Circular economy and bioeconomy sectors’ impacts, in line with the European Green Deal, the EU bioeconomy strategy & its action plan as well as the EU industrial strategy. A proposal is expected to address in particular: i) developing innovative and sustainable value-chains in the bio-based sectors and ii) enhancing European industrial sustainability, competitiveness and resource independence. Expected impacts will be achieved via research and innovation on industrial biotechnology and other enabling technologies, as a prerequisite and driver of future solutions for the bioeconomy transition.

Project results are expected to contribute to all of the following outcomes:

- Enhanced EU bio-based sector competitiveness, sustainability and resource independence, including SMEs. More specifically, successful projects will contribute to a paradigm shift from enzymes and industrial microbial-hosts dependent processes to

²⁵⁰ Horizon 2020 topic FNR-11-2020-(B). Prospecting aquatic and terrestrial natural biological resources for biologically active compounds, projects MARBLES, SECRETed, ALGAE4IBD.

²⁵¹ Horizon 2020 topic FNR-11-2020-(A). Prospecting aquatic and terrestrial natural biological resources for biologically active compounds, project InnCoCells.

evolved microbial hosts and enzymes, for improved (bio-based) process/production robustness and flexibility.

- Enabling environmental performance improvements of bio-based processes (encompassing climate-neutrality, circularity and zero pollution) through resource efficient valorisation of sustainable biomass feedstock, while addressing pollution issues in production processes.
- Long-term benefits to the bio-based sector, consumers and end-users, by more environmentally-friendly as well as more technically and economically feasible applications in diverse value chains, also underpinned by progress in industrial biotechnology.

Scope: The overall scope focuses on widening the range of known robust enzymatic catalysts and industrial microbial hosts,²⁵² as well as on the potential of scaling up their deployment and thus exploring their potential to offer significant gains in bio-based processes and their flexibility against variable process parameters, namely: resource efficiency, energy efficiency and other process metrics. These efforts will then eventually aim for development of novel, or significantly optimised, sustainable (bio-based) processes and products (e.g. chemicals, materials).

Proposals should address:

- Identification and bioprospecting of novel natural enzymes and/or microbial hosts, including though the use of existing sequencing data, from all types of environments (especially terrestrial but also marine).²⁵³ The identified solutions must especially address extreme habitats (relevant to bio-based processes conditions/ challenges-*see next point*).
- Optimisation of enzymes' and/or microbial hosts' properties for industrial use, addressing (bio-based) process conditions barriers. Such barriers comprise of physical parameters (e.g., temperature, pH) and chemical parameters/stressors (e.g., solvents, variable biomass feedstock composition, contaminants etc.). Optimisation efforts may include understanding, modification and control of microbial hosts and enzymes, (e.g. via Synthetic Biology methodologies).
- Testing and demonstrating of novel concepts for industrial enzyme-catalysed or microbial host-based processes (e.g., engineering of enzyme cascades/multi-enzyme reactions, co-factor regeneration, broader range of functional activity etc.) to valorise biomass and produce high-value bio-based products.
- Demonstrating optimised process design, development and control aspects, with considerations for implementation of automation, integration of unit operations, robust

²⁵² Microbial-hosts: both prokaryotic and eukaryotic organisms such as fungi.

²⁵³ For marine environments, please consider any relevant past or ongoing topics under heading 'Innovating for blue bioeconomy and biotechnology value chains (e.g. HORIZON-CL6-2024-CircBio-01-10: Targeting aquatic extremophiles for sourcing novel enzymes, drugs, metabolites and chemicals

and precise process analytical technologies (PAT), and the horizontal incorporation of enabling digital technologies, where necessary for improving process efficiency but also achieving environmental performance improvements.

- Assessment of the tested, optimized enzyme-catalysed or microbial host-based processes with respect to biotechnological, economic, environmental performance (lifecycle assessment) as well as safety parameters and standards.
- Linking to the ongoing work on sustainability improvements via industrial biotechnology²⁵⁴, if underpinned by the thematic focus on enzymes.
- Beneficiaries should pay attention to the delivery of FAIR data, results and methodologies.

Where relevant, proposals should overall seek links and synergies as well as capitalise on the results of past and ongoing EU research projects²⁵⁵ of Horizon 2020, LIFE, Horizon Europe (including the Bio-based Industries Joint Undertaking (BBI JU) /Circular Bio-based Europe Joint Undertaking (CBE JU)).

Proposals should also include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CircBio-01-6: Bio-based solutions for humanitarian applications

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply:

²⁵⁴ See parallel topic HORIZON-CL6-2023-ZEROPOLLUTION-01-5: Industrial biotechnology approaches for improved sustainability and output of industrial bio-based processes.

²⁵⁵ In particular Horizon 2020 call [FNR-16-2020 topic](#) 'Enzymes for more environment-friendly consumer products', H2020-FNR-16-2020 projects, such as: [EnXylaScope](#) – 'Mining Microbes and Developing Advanced Production Platforms for Novel Enzymes To Rapidly Unleash Xylans' Potential In a Scope Of Products For the Consumer Market; [FuturEnzyme](#) - Technologies of the Future for Low-Cost Enzymes for Environment-Friendly Products, [RADICALZ](#) 'Rapid discovery and development of enzymes for novel and greener consumer products'.

	<p>Due to the scope of the topic, legal entities established in low- and middle-income countries (see General Annexes) may exceptionally participate in this Coordination and support action as beneficiaries or affiliated entities.</p> <p>The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).²⁵⁶.</p>

Expected Outcome: Successful proposals will contribute to Destination ‘Circular economy and bioeconomy sectors’ impacts, including: i) accelerating transitions towards a sustainable, regenerative, inclusive, just and clean circular economy and bioeconomy, ii) developing innovative and sustainable value-chains in the bio-based sectors as well as iii) improving citizen benefits by establishing circular and bio-based systems based on sustainability, inclusiveness, zero pollution.

More precisely, successful proposals will provide humanitarian aid operators and bio-based sector stakeholders, with science-based information on the application potential, sustainable performances and circularity of bio-based solutions and options, suitable for humanitarian purposes. Projects’ results will thus contribute to further improve on the social benefits of bio-based systems, in line with the European Green Deal, the bioeconomy strategy, the EU circular economy action plan and the EU zero pollution action plan.

Projects results are expected to contribute to the following expected outcomes:

- Identification of sustainable bio-based solutions of applicable performance under humanitarian aid contexts, addressing the technical challenges posed by diverse environmental, social and economic conditions.
- Improved way to address waste management and waste-related challenges in humanitarian aid contexts.

²⁵⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Significant reduction/minimisation of waste (e.g., plastic or fibres waste) littered in the environment.

Scope: The global solid waste management crisis (and any related pollution) is increasingly urgent to address and it can disproportionately affect countries that commonly receive humanitarian assistance. Humanitarian aid, including EU-funded aid, is delivered both within EU boundaries and beyond, including to remote areas, posing logistics challenges of waste management. This call would contribute by examining on how bio-based products and systems could contribute to managing environmental challenges relevant to waste in humanitarian contexts. For example, based on existing assessment studies²⁵⁷, issues pertain with durability of materials compared to the timeframe needed for their integrity to guarantee necessary quality, cost effectiveness of managing waste, prevention of littering, safety to end-users and operators as well reuse, recycling, or biodegradability and composting of waste materials in humanitarian settings.

Proposals should:

- Assess the scope for which bio-based innovative technological solutions as well as bio-based systems have more environmentally sound applicability (including zero pollution and climate change considerations) for different and relevant applications,²⁵⁸ under humanitarian contexts (scoping exercise).
- Evaluate socio-economic/governance aspects, including the replication potential of appropriate solutions.
- Include appropriate lifecycle assessment methodologies to examine the potential to reduce the environmental impact (accounting also for biodiversity, ecosystems preservation and enhancement, zero pollution as well as greenhouse gas emissions) of proposed solutions, under relevant humanitarian aid conditions (variable environmental, social and economic conditions).
- Develop guidelines and recommendations to policy makers, bio-based sector actors as well as humanitarian aid operators/practitioners (e.g., NGOs). Such guidelines can address further R&D&I needs and socioeconomic considerations, detailing on the potential of bio-based products and bio-based systems for uptake, based on the scoping exercise and a SWOT analysis. For all aforementioned aspects, humanitarian context specificity is crucial and must be taken into account for the analysis.
- Implement multi-actor approach (MAA) by involving a wide range of bio-based sector actors, humanitarian aid actors as well as other relevant stakeholders, accounting also for trans- and inter-disciplinary research.

²⁵⁷ E.g., World Food Programme Environmental Sustainability Unit.

²⁵⁸ E.g. plastic products and packaging, logistic assets, textiles, waste treatment, water treatment etc.

Where relevant, proposals should seek links and synergies as well as capitalise on the results of past and ongoing EU research projects²⁵⁹ (Horizon 2020, LIFE, Horizon Europe, including the Bio-based Industries Joint Undertaking (BBI JU) / Circular Bio-based Europe Joint Undertaking (CBE JU)).

International cooperation and the consideration of gender-related aspects are highly encouraged. Social Innovation and social science and humanities (SSH) aspects should form an essential part of the funded projects.

HORIZON-CL6-2023-CircBio-01-7: Symbiosis in the bio-based industrial ecosystems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁶⁰ .

Expected Outcome: Successful proposals will enable the bio-based industries in the Union to contribute to the enhancement of European industrial sustainability, competitiveness and resource independence, developing industrial symbiosis and circularity by design and to the development of innovative and sustainable value-chains in the bio-based sectors as a prerequisite and driver of future solutions for a circular economy and the bioeconomy transitions. Projects results will contribute to deliver bio-based solutions with reduced environmental impacts on soil, water, and air quality, biodiversity and climate, in line with the EGD objectives, the EU circular economy action plan, the bioeconomy strategy and the implementation of the transition pathway for the EU chemicals industry.

²⁵⁹ E.g., see also parallel topic HORIZON_CL6-2024-CircBio-01-05 Programmed biodegradation capability of bio-based materials and products, validated in specific environments.

²⁶⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Projects results are expected to contribute to all of the following expected outcomes:

- Innovative processes and industrial symbiosis approaches in the bio-based industrial value chains, enabling local security of supply chains and the maximum valorisation of biological resources while minimizing the use of hazardous substances and waste streams;
- Monitoring systems of the industrial symbiosis in the bio-based industrial value chains.

Scope: In the transition towards an effective circularity and zero pollution within the industrial ecosystems in the Union, the production of goods and services must optimize the use of any resource. Industrial symbiosis is instrumental to this goal, as it is based on the sharing of resources between facilities when wastes or by-products from an industry or industrial process becomes the raw material for another. A well-developed symbiosis across bio-based facilities aims at zero-waste value chains, ensuring more local supply chains, minimizing the use of input material resources, while reducing all the environmental impacts on soil, water, and air quality, biodiversity and climate, of all the processes involved. This should also bring an increase in the economic value of final products and a better distribution of economic and social benefits among the stakeholders. Industrial bio-based facilities within the scope of this topic include those producing bio-based materials and products (e.g., paints, coatings, inks and dyes, polymers, construction materials, fibres, personal care products, plasticisers, adhesive, lubricants, platform chemicals, solvents, surfactants, etc.).

To improve the knowledge for the implementation and scaling up of industrial symbiosis in the bio-based industries proposals should:

- Analyse the applicability of existing methods and approaches individuating and assessing technical solutions enabling the symbiosis to specific sectors/facilities within the bio-based industrial ecosystems (but also their symbiosis with non-bio-based industrial assets), including supported by digital innovation and AI, based on existing studies²⁶¹ and on the knowledge collected and elaborated under the European Community of Practice²⁶² (ECoP);
- Improve existing and/or develop new methods to assess the circularity and symbiosis of bio-based industrial ecosystems, taking into considerations specific KPIs developed in the above-mentioned ECoP;
- Assess and optimize the environmental sustainability of symbiotic processes in terms of (decreased) impacts on soil, water, and air quality, biodiversity and climate;
- Evaluate the economic and social benefits of the industrial symbiosis assets in terms of increased economic value of final industrial products, better distribution of economic

²⁶¹ See for example the study “Study and portfolio review of the projects on industrial symbiosis in DG Research and Innovation” <https://op.europa.eu/en/publication-detail/-/publication/f26dfd11-6288-11ea-b735-01aa75ed71a1>.

²⁶² See the CSA funded under the topic HORIZON-CL4-2021-TWIN-TRANSITION-01-16: Hubs for Circularity European Community of Practice (ECoP) platform (Processes4Planet Partnership).

and social benefits among the stakeholders, improved utilisation of local supply chains, and integration in local (national and regional) strategies supporting circular approaches;

- Individuate high-potential regions/areas, or specific industrial hubs for the demonstration of the developed symbiotic approach. Criteria for the individuation of such sites should focus on process level, symbiosis process implementation, commitment level of the local authorities and communities, regional specificities (business/industrial policy and strategies), additional funding, potential private investors, etc., also taking stock from the EU Hubs for Circularity (H4C) experiences²⁶³;
- Engage with stakeholders, including local authorities and communities to disseminate the social and economic benefits from innovation in industrial symbiosis, bio-based industries, universities or other educational institutions to facilitate the training of circular practitioners;
- Develop a targeted reporting system of the effectiveness of the technical solutions, based on ad-hoc monitoring capacity along the bio-based value chains working in symbiosis.

Projects are expected to contribute to the New European Bauhaus (NEB) initiative by interacting with the NEB Community, NEB Lab and other relevant actions of the NEB initiative through sharing information, best practices, and, where relevant, results.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects, including under the Circular Bio-based Europe JU and other partnerships of Horizon Europe and beyond.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CircBio-01-8: Eco-friendly consumer products – low-toxicity/zero pollution construction bio-based materials

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.

²⁶³ [Hubs for circularity - Publications Office of the EU \(europa.eu\)](https://publications.ec.europa.eu/hubs-for-circularity)

<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to all Destination ‘Circular economy and bioeconomy sectors’ impacts related to consumers and industry, in particular to development of innovative and sustainable value-chains in the bio-based sectors and of European industrial sustainability, competitiveness and resource independence, including via research on biotechnology and other enabling technologies, as a prerequisite and driver of future solutions for a circular economy and the bioeconomy transitions.

Project results are expected to contribute to all of the following outcomes:

- Higher environmental sustainability, including on the climate targets (primarily reduction of greenhouse gas emissions, and accessorially increase of carbon removals), and zero pollution demonstrated by LCA approaches of bio-based materials and products for construction applications, allowing their intensified sustainable use, under the New European Bauhaus Initiative²⁶⁴ and the Renovation Wave²⁶⁵;
- Demonstrated non-toxic and zero-pollution properties of the construction materials, as well as their recyclability and/or reusability, to respond to the higher societal demand and the objectives of the European Green Deal;
- Increased competitiveness of European industry, including SME sector, and involving various actors of bio-based value chains; while ensuring affordable and sustainable end-products for the consumers and society, including via integration of digital solutions;
- Improved innovation potential in regard to biotechnology, and its potential contribution to the sustainable, circular bio-based materials and biochemicals, with safe, environmentally-friendly and functionally performing applications;
- Improved societal innovation and creativity, with inclusive engagement of all societal actors, especially professional bodies, policymakers, designers, architects, consumers and end-users, for the bio-based construction product segments. This is expected to contribute, e.g., by developing recommendations or guidelines, or public engagement/dialogue, to the policy-feedback on innovative construction materials, and to resolving related regulatory bottlenecks.

Scope: Bio-based construction materials offer major opportunities to contribute to the climate-neutral and zero-pollution objectives of the European Green Deal, replacing fossil-based

²⁶⁴ [COM\(2021\)573](#) final “New European Bauhaus Beautiful, Sustainable, Together”. Projects are expected to contribute to the New European Bauhaus (NEB) initiative (https://europa.eu/new-european-bauhaus/index_en) by interacting with the NEB Community, NEB Lab and other relevant actions of the NEB initiative through sharing information, best practice, and, where relevant, results.

²⁶⁵ [COM\(2020\)662](#) final “A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives”.

alternatives, and so, reducing the environmental footprint, while offering economic benefits to the actors involved. However, care needs to be taken to ensure sustainability of sourcing and production process, while guaranteeing safety and positive user experience. This calls for high level of innovation and creativity, ensuring full inclusiveness of participation for all actors.

Proposals will focus on:

- Identification and upscaling of bio-based materials suitable for the construction sector, understood as bio-based feedstocks, e.g. agro-forestry²⁶⁶ residues, fibres, recycled organic materials, industrial by-products etc, obtained especially by higher circularity of available biomass, under the cascading use of biomass principle. However, the selected materials can also be found in other bio-based resources that, due to their specific genetic / physiological / biochemical backgrounds have functional properties, which can be further improved or upgraded by fermentation, biomanufacturing, or biotechnology approaches. Also, the hybrid integration of living organisms into traditional or bio-based construction materials (e.g., plants, algae, fungi) might be considered, if leading to higher quality and improved environmental impact. The range of final construction materials is broad and may cover composites, insulation materials, interior or exterior elements, adhesives, etc., depending on the construction value chain selected.
- Innovating in terms of bio-based production improvements (e.g., additive bio-based manufacturing, nature-based solutions,___or composite materials with added functionalities), leading to new construction-oriented consumer applications. This effort should benefit from innovation developed both from the technical angle, but also from social innovation and from inclusive participation of all actors, including development of recommendations for pre-normative or/and regulatory actions, related to new (recyclable/reusable) bio-based construction materials, as appropriate.
- The safety and user experience aspects should be duly considered and included in the developed solutions.
- Communication and dissemination will form an essential part of the projects, especially as related to the sustainability, ‘reconnection with nature’ and inclusiveness aspects.
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.
- International cooperation is encouraged to benefit from exchange of best practices, while taking care of European (industrial) competitiveness.
- SSH aspects should be considered and covered, as well as the contribution from digital solutions.

²⁶⁶ Synergies with R&D on traditional bio-based feedstocks such as wood may be sought, e.g., see topic HORIZON-CL6-2024-CLIMATE-01-5: Climate-smart use of wood in the construction sector, or activities under the Circular Bio-based Europe (CBE) JU.

HORIZON-CL6-2023-CircBio-01-9: Business models that balance the share of power and profit in the bioeconomy

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000. Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁶⁷ .

Expected Outcome: This topic is supporting the bioeconomy strategy and the common agriculture policy (CAP) by promoting diverse forms of cooperation among primary producers to create value-added bio-based products in fair value chains via advanced biorefineries.

Project results are expected to contribute to all of the following outcomes:

- Revitalisation and resilience of rural economies by creating new green jobs and investments.

²⁶⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Development and validation of replicable, scalable production and business models for the operation of biorefineries that offer economic opportunities in rural areas and contribute to a fair distribution of benefits in bio-based value chains.
- Enhanced joint investment in R&D and demonstration plants.
- Linking of underutilised feedstock types with available technologies and market information, improved logistics and quality standards.
- Identification of factors for success and policy recommendations in view of robust contracts and agreements, training and capacity building, shared business plans, marketing strategies for bio-based products as well as financial and legal aspects.
- Climate-neutral land sector by 2035 and climate-neutral economy by 2050.
- Diversification and enhancement of agricultural incomes (organic and conventional farming) and transition towards sustainable food systems in line with the farm to fork strategy.
- Enhanced cooperation between primary producers and other key actors along the value chain in the bio-based economy.

Scope: The circular use of waste, by-products and residues from agriculture, forestry, and the agri-food industry can lead to the creation of new economic opportunities in rural areas. However, primary producers are often not fully integrated in bio-based value chains, and thus, benefits are not sufficiently distributed among value chain actors.

This topic addresses diverse forms of cooperation among primary producers and suitable business models to create high-value bio-based products in vertically integrated value chains via advanced biorefineries.

Proposals will:

- Examine the potential of contractual agreements or fully developed shareholder/ownership concepts (e.g., cooperatives) to create sustainable and competitive innovations in the bio-based economy through the conversion of by-products, residues and wastes from agriculture and forestry.
- Develop and promote business models for different primary production sectors in the EU that build on existing rural infrastructures, support the economies of scale, and contribute to a fair distribution of costs, benefits, and risks amongst the economic operators.
- Contribute to a better understanding of sustainable and fair biobased supply chains, synergetic points along and across agricultural, forestry and industrial value chains as well as industrial symbiosis opportunities.

- Explore existing investment options, including non-traditional sources (e.g., cross-sectoral collaborations, etc.) and identify barriers and enablers for sustainable long-term operations.
- Contribute to restoring carbon content in soil, increasing nutrients, revitalising marginal lands and ensuring food security.
- Consider further socio-economic factors, influencing farmers' behaviour and develop indicators to assess the economic, environmental and social impacts for farmers, foresters and rural areas through increased cooperation.
- Connect with a wide range of stakeholders (farmers, foresters, industry, processors, advisors, clusters, etc.) and develop together a portfolio of research and innovation priorities that can be implemented in Horizon Europe and relevant European partnerships such as the Circular Biobased Europe.
- Promote bioeconomy-related interventions in the new CAP and provide advice and technical guidance for Member States.

Proposals shall apply the concept of the 'multi-actor approach' and ensure adequate involvement of the farming sector, SMEs and other actors active in rural areas.

Proposals may involve financial support to third parties e.g. to primary producers, academic researchers, start-ups, SMEs, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. Consortia need to define the selection process of organisations, for which financial support may be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Cooperation with other selected projects under this topic is strongly encouraged.

HORIZON-CL6-2023-CircBio-01-10: Supporting the fair and just transition from GHG-intensive economies facing challenges towards circular bioeconomy model regions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must

	use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁶⁸ .

Expected Outcome: Successful proposal will contribute to the expected impacts of Destination ‘Innovative governance, environmental observations and digital solutions in support of the Green Deal’, and the European policies it supports, by supporting the establishment of the innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation.

In line with the European Green Deal priorities, the EU’s climate targets for 2030 and 2050, the objectives of the EU biodiversity strategy for 2030, the farm to fork strategy and the vision of a society that acts within environmental and social boundaries as defined in the bioeconomy strategy, the successful proposal will guide and facilitate the green transition towards a circular bioeconomy model, in regions that lag behind in this process.

Projects results are expected to contribute to all following expected outcomes:

- Outline widespread best practices showing the economic, social and environmental opportunities and the challenges of transforming GHG-intensive economies, such as coal mining, intensive agriculture such as livestock or crop production, forestry, and fisheries, and peat production, towards circular bioeconomy model regions;
- Strengthened interactions and coordination between affected European / Associated Countries regions.

Scope:

- Identify just and fair bioeconomy solutions in regions that face difficulties in the green transition to leave no person and no place behind.
- Establish a network structure for European / Associated Countries regions to exchange views, best practices and align their work to overcome common challenges.

²⁶⁸ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Identify new bioeconomy structures that generate local green growth in regions currently relying on carbon-intensive economic activities that would be utilised by the IA project funded under HORIZON-CL6-2024-CircBio-01-07: Demonstrating the fair and just transition from GHG-intensive economies facing challenges towards circular bioeconomy model regions.
- Provide logistical support to the IA project funded under HORIZON-CL6-2024-CircBio-01-07: Demonstrating the fair and just transition from GHG-intensive economies facing challenges towards circular bioeconomy model regions.
- Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.
- Implement the required multi-actor approach by involving a wide diversity of bioeconomy actors and conducting trans-disciplinary research.
- Where relevant, activities should build and expand on the results of past and ongoing research projects.
- This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Innovating for blue bioeconomy and biotechnology value chains

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-01-11: Novel culturing of aquatic organisms for blue biotechnology applications

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: The selected proposals are expected to contribute to all of the following outcomes:

- Expansion of the potential offered by marine or other aquatic biological resources through advances based on the greater knowledge of the functioning, processes and ecological interactions of marine and other aquatic organisms;
- Development of aquatic biotechnology solutions in cultivation and optimisation of production yield;
- Increased bio discovery of products through sustainable methods for robust aquatic bio-based production, including possibly production of chassis cells, as an alternative to wild harvesting;
- Support to green industrial bioprocessing and more sustainable bio-based products through new biotechnology processes and applications;
- Contribution to the development of circular processing.

Scope: The biotechnological exploitation of both pelagic and benthic marine and other aquatic (such as the ones living in fresh waters, transitional waters and ice ecosystems) organisms often requires their cultivation and the optimisation of production yield for the compounds of interest. Aquatic biota, and in particular marine ones (bacteria, algae, fungi or invertebrates such as sponges, corals and molluscs), cannot be easily cultured. It is believed that just a fraction of 1% of marine bacteria can be cultured using existing methods, and viruses and bacterial and viral phages, present even greater challenges. The culturing of aquatic organisms offers a sustainable alternative to wild harvesting. The potential environmental footprint and impact on health, sustainability and biodiversity aspects need, nevertheless, to be thoroughly assessed and safety established, through risks analysis linked to possible dissemination of newly developed organisms in nature. Culturing methods should be developed in sealed conditions, such completely in vitro or in aquaria and mesocosms, with particular attention to avoid spread of non-indigenous species in the natural aquatic environment.

Proposals under this topic should:

- Develop culturing methods (including for mixed cultures) for vertebrate and invertebrate cell lines for the production of active compounds particularly based on co-metabolism between community members that represent a radical change from the conventional “isolate and enrich” approach to cell culture;
- Develop bio-engineering tools for the use of marine and other aquatic model organisms to improve the availability of metabolites for industrial applications;
- Optimise culturing conditions so that the relevant metabolites are appropriately expressed and can be recovered with selective downstream processing techniques.

Selected projects should collaborate with each other. In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Safeguarding and sustainably innovating the multiple functions of EU forests

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-01-12: Optimising the sustainable production of wood and non-wood products in small forest properties and development of new forest-based value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: This topic supports the EU forest strategy for 2030 by securing and promoting small-scale forest management for the sustainable use of wood and non-wood products, while fully respecting the cascading use principle and contributing to biodiversity and climate objectives, including forest ecosystem restoration and protection.

Project results are expected to contribute to all of the following outcomes:

- Development of regional and local management models for small-scale forest holdings in support of the EU forest strategy for 2030, adapted to the wide variety of contexts found in the EU.
- Better understanding of knowledge, skills, motivation and needs of small-scale forest owners, and development of targeted and innovative approaches for effective support structures and instruments for the various ownership types.

- Contribution to forest-related policy goals of the European Green Deal, including the development of a forest-based bioeconomy, the reduction of greenhouse gas emissions, the increase of carbon removals, the protection of ecosystem services and the restoration and conservation of forest biodiversity.
- Improved guidelines on carbon farming and PES (Payment for Ecosystem Services) design and implementation in Europe formulated and implemented.
- Development of lively, prosperous and resilient rural areas and integration of small-scale forests owners in the bioeconomy value chains.
- Improvement of the quantity and quality of EU forests, their multifunctional role and resilience needs under climate change and contribution to halting and reversing biodiversity loss.

Scope: European forests belong to around 16 million owners, whereby about 60% of the forest area is privately owned, the majority being small properties, often lacking proper attention by their owners mainly due to fragmentation and non-profitability. Knowledge on small-scale private forest owners' expertise, skills, motivations and needs to manage forests sustainably, including both traditional and non-traditional owner types, is limited.

Genuinely trans-disciplinary approaches in research and innovation are needed that combine the environmental and socio-economic dimensions and closely engage with broader stakeholder communities.

This topic addresses sustainable production potentials with a view to securing and promoting small-scale forest management for the sustainable use of wood and non-wood products, while fully respecting the cascading use principle and contributing to biodiversity objectives, including forest ecosystem restoration and protection.

Proposals will:

- Create a better understanding of the circumstances of small forest property owners and behaviour for both traditional and non-traditional owner types.
- Explore, analyse, and develop innovative forest management approaches, including silvicultural practices, carbon farming, digital tools (for example blockchain, robotics, AI or IoT/sensors), organisational, cooperation and business models, advisory services, education and training concepts, policy frameworks and social and institutional models that take into account different ownership types.
- Assess and develop innovative and tailored support structures, programmes and instruments, covering traditional and non-traditional owner types, considering size, geographical, professional and personal backgrounds, value orientations, age, gender, etc.

- Collect, analyse, and develop targeted approaches for activating and mobilising forest owners, particularly non-traditional, non-farm, absentee, urban or women as forest owners taking into consideration existing good practice guidance and examples.
- Define sustainable production potentials for wood and non-wood forest products through improved integrated management approaches.
- Develop new business models to promote the sustainable and value-added utilisation of damaged (burnt, broken, degraded conditions etc.) or infected wood (e.g., by bark-beetle, etc.) within strictly defined ecological thresholds and in line with the cascading use principle, forestry side streams and non-wood forest products (e.g., cork, etc.).
- Contribute positively to the UN and EU sustainability goals (climate, biodiversity, risks, income streams, ecosystem services etc.).
- Explore the role of social, economic, political, and institutional factors to improve political-institutional frameworks on different administrative levels.
- Engage small forest property owner types and all relevant actors in co-creation processes for developing viable measures and tools at local and European scale that contribute to increased awareness and motivation for ensuring sustainable use, restoration, and conservation of resilient small-scale private forest properties.
- Involve rural communities with a view to optimising the mobilisation of forest resources, improving land management practices, and reducing land abandonment in full respect of climate mitigation and adaptation, biodiversity protection and restoration objectives.
- Foster knowledge exchange and capacity-building.

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain.

Proposals may involve financial support to third parties e.g. to primary producers, academic researchers, start-ups, SMEs, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. A maximum of € 60 000 per third party might be granted. Conditions for third parties support are set out in Part B of the General Annexes. Consortia need to define the selection process of organisations, for which financial support may be granted. Maximum 20% of the EU funding can be allocated to this purpose. The financial support to third parties can only be provided in the form of grants.

HORIZON-CL6-2023-CircBio-01-13: Capturing market trends and societal perceptions for tailor-made forest services

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately.

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: This topic contributes to the new EU forest strategy for 2030 by addressing new opportunities for primary producers to diversify income and employment opportunities and developing new sustainable business models.

Project results are expected to contribute to all of the following outcomes:

- Improved integrated management concepts with a focus on market-oriented approaches to meet the growing demand for ecosystem services, including carbon removals through carbon farming.
- Development of decision support and management tools (including digital technologies such as AI, sensors or robotics) that will facilitate the joint delivery of multiple ecosystem services.
- Increased long-term resilience of forest production and use systems and associated value chains.
- Improved guidelines on carbon farming and PES (Payment for Ecosystem Services) design and implementation in Europe formulated and implemented.
- Accelerated uptake of sustainable business models in the primary production sector.

Scope: Forests provide invaluable benefits to people and the planet. They are biodiversity hubs and habitats, vital for climate and water regulation, soil stabilisation and the purification of air and water. Their carbon sequestration and storage capacity make them an important ally in the fight against climate change. Also, forests and the forest-based sector provide multiple socio-economic functions and benefits, including jobs and development possibilities in rural areas. Their role in providing food, medicines and materials and their value for recreation and learning from nature is indispensable for the transition to a circular bioeconomy and a healthy society.

However, there is an increasing demand on European forests to provide a high diversity of goods and ecosystem services at the same time. The choice of forest management can produce different outcomes for ecosystem services and productivity in the short and the long-term.

Forest owners should consider possible trade-offs and synergies with regards to the multifunctional role of forests, their interaction with climate change and their role for biodiversity. Therefore, there is a need for balanced and integrative approaches to ensure ecosystem services in the long-term and to provide sufficient resources for a sustainable and circular bioeconomy, while at the same time, contributing to GHG emissions reductions and carbon removals to contribute to 2030 and 2050 EU climate targets.

This topic addresses new opportunities for primary producers to diversify the income by developing new sustainable business models.

Proposals will:

- Set-up a transdisciplinary forum at the science-policy-society interface to regularly disseminate research results, discuss options for upscaling promising approaches (including technological needs and possible solutions) and collaborate with relevant policy makers, stakeholders and the wider public.
- Explore the evolving societal demands under changing climate conditions for different forest goods and services in an interdisciplinary and integrative approach to improve the knowledge that will help to balance the demands while safeguarding forest's capacities to deliver them in the best possible way.
- Based on previous research results (e.g., InnoForest²⁶⁹, Sincere²⁷⁰, etc.), improve the understanding of ecosystem service interactions at different temporal scales both short-term and long-term and consider relevant social, environmental and economic interdependencies and path dependencies.
- Identify region and national specific market-driven approaches to create new or reactivate value chains and business models based on co-operation between forest owners, policymakers and users of ecosystem services with a view to develop tailor-made solutions and strengthen interdisciplinary and cross-sectoral cooperation.
- Select a set of representative European PES cases, including carbon farming cases, with sufficient implementation length and data availability for a holistic impact evaluation.
- Analyse and compare the data for contextualizing results vis-a-vis the existing literature on PES design and implementation, including carbon farming.
- Improve existing and develop new business models to determine the value and possible funding of sustainable forest management, including through the valuation of ecosystem services such as biodiversity, non-wood products, carbon sequestration and storage, clean water supply, soil protection, recreation, health amenities etc.; and develop standardized methods for their valuation where needed with the goal to maximise sustainable benefit across ecosystem services.

²⁶⁹ <https://cordis.europa.eu/project/id/763899>.

²⁷⁰ <https://cordis.europa.eu/project/id/773702>.

- Propose standards for measuring, assessing and valuating ecosystem services in different regional settings, which could lead to more efficient market mechanisms across Europe in support of forest management practices ensuring sustainable use and biodiversity conservation and restoration.
- Promote and provide advice for the set-up of adequate payment schemes through private and public funding instruments at national and EU-level (including the CAP).

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2023-CircBio-01-14: Monitoring the multi-functionality of European forests

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: This topic supports the implementation of the new EU forest strategy for 2030 by addressing the design of a comprehensive forest information system that align information on forest and soil state, the provision of ecosystem services (including biomass, biodiversity and carbon removals) and socio-economic demands on ecosystem services.

Project results are expected to contribute to all of the following outcomes:

- Development of a comprehensive information base for all stakeholders involved in forest matters, from policy making, through forest restoration and conservation planning and funding of such activities, to practical forest management.
- Successful implementation of forest-related policy objectives under the European Green Deal, including the building of a forest-based bioeconomy, the reduction of greenhouse gas emissions, the increase of carbon removals, the contribution to climate change adaptation, the provision of ecosystem services and the conservation and restoration of forest biodiversity.
- Better understanding of the quantity and quality of European forests, their multifunctional role and resilience needs under climate change and contribution to halting the loss of biodiversity.
- Efficient implementation of possible certification schemes in relation to forest multifunctionality (e.g., closer-to-nature forest management practices, carbon farming).

Scope: In the context of climate change impacts, accelerated biodiversity loss and the need to adjust our socio-economic system to a more sustainable alternative, forests play increasingly a double role as victim and part of the solution. While their resilience and potential are under threat, they help to mitigate climate change (e.g., through carbon sequestration), and contribute to climate change adaptation (buffering thermal variations or variations in water flows), harbour large parts of terrestrial biodiversity and provide feasible solutions to support the transition to a bioeconomy.

To adequately manage forests and the services they provide, reliable, up-to-date, and coherent European forest information is more important. However, one of the challenges remain how to integrate information from different sources on the many functions that forests fulfil and the benefits they provide to society. Currently, data are scattered and often focusing on a limited set of indicators, which do not adequately represent the multi-functionality of forests.

This topic addresses the design of a comprehensive forest information system that aligns information on forest state, ecosystem services (including biomass) provision and socio-economic ecosystem services demand.

Proposals will:

- Develop a list of parameters relevant for monitoring of a range of ecosystems services provided by forests.
- Consider the latest scientific knowledge and technology (e.g., through the use of AI, IoT/sensors, robotics and blockchain) for the development, combination, and utilization of reliable data from multiple sources (e.g., national forest inventories, remote sensing, environmental monitoring, large scale societal surveys, national or smaller-scale economic data etc.)

- Assess and propose suitable solutions to make these data available, also by considering issues related to the governance and funding of a fully harmonised monitoring system at EU-level.
- Engage in a structured dialogue with institutions and stakeholders, including the European Commission, national competent authorities, representatives of the forest-sector, as well as data providers to align the needs and possibilities of data collection, provision, and use.

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain.

Proposals may involve financial support to third parties e.g. to primary producers, academic researchers, start-ups, SMEs, data providers, national administrations, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. A maximum of € 60 000 per third party might be granted. Conditions for third parties support are set out in Part B of the General Annexes. Consortia need to define the selection process of organisations, for which financial support may be granted. Maximum 20% of the EU funding can be allocated to this purpose. The financial support to third parties can only be provided in the form of grants.

Proposals should build on past or ongoing research projects and collaborate with relevant initiatives, including the Forest Information System for Europe (FISE).

Cross-articulation with the other data spaces, and notably with the European Open Science Cloud should be foreseen, exploiting synergies and complementarities of the different approaches. Efforts should be made to increase the data availability in the appropriate data-infrastructures for further uses.

JRC is available for sharing and taking up results and findings on the monitoring of the forest ecosystem multifunctionality in the EU Observatory for Deforestation, Forest Degradation and Associated Drivers and JRC Big Data Analytics Platform.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Call - Circular economy and bioeconomy sectors

HORIZON-CL6-2023-CIRCBIO-02

Conditions for the Call

Indicative budget(s)²⁷¹

²⁷¹ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ²⁷²	Indicative number of projects expected to be funded
		2023		
Opening: 22 Dec 2022				
Deadline(s): 28 Mar 2023 (First Stage), 26 Sep 2023 (Second Stage)				
HORIZON-CL6-2023-CircBio-02-1-two-stage	IA	58.00	9.00 to 10.00	6
HORIZON-CL6-2023-CircBio-02-2-two-stage	IA	14.00	Around 7.00	2
HORIZON-CL6-2023-CircBio-02-3-two-stage	RIA	8.00	Around 4.00	2
Overall indicative budget		80.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

²⁷² Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Enabling a circular economy transition

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-02-1-two-stage: Circular Cities and Regions Initiative (CCRI)'s circular systemic solutions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR 9.00 and 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 58.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	<p>The conditions are described in General Annex A. The following exceptions apply:</p> <p>Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).</p>
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following exceptions to the conditions described in General Annex B apply:</p> <p>Proposals funded under this topic, and their circular systemic solutions, must form part of the demonstration projects for the implementation of the European Commission's Circular Cities and Regions Initiative (CCRI). This means: (i) that proposals must cooperate with CCRI and its Coordination and Support Office by means of sharing with this initiative knowledge and experiences developed during the implementation and demonstration of the circular systemic solutions; (ii) proposals must participate in the CCRI's events.</p> <p>Applicants must integrate explicitly these obligations into their proposal's work plan.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply:

	This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.
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Expected Outcome: Successful proposals will support the delivery of solutions to implement the European Green Deal, the EU circular economy action plan (CEAP) and the bioeconomy strategy. The topic will support the transition towards a sustainable, regenerative, inclusive and just circular economy at local and regional scale across regions of Europe, boosting interregional and cross border cooperation.

Proposals funded under this topic will form part of the demonstration projects for the implementation of the European Commission's Circular Cities and Regions Initiative (CCRI)²⁷³. Proposals are expected to provide policymakers, public and private investors and local communities with concrete and demonstrated examples of circular systemic solutions.

Projects results are expected to contribute to all the following expected outcomes:

- Significantly increased circularity, reduced GHG emissions, and where relevant increased carbon removals, in product value chains, and efficient valorisation of local resources in cities, regions or their groupings.
- Creation of business opportunities and jobs in the circular economy at urban and/or regional scale.
- Increased uptake and participation of citizens in circular and climate-neutral practices.
- Enhanced knowledge transfer between the cities, regions or their groupings involved in the proposals financed under this topic and other cities and regions in EU Member States and Associated Countries.
- More effective widespread uptake and easier replication, scalability and visibility of circular systemic solutions and hence multiplication of their economic, social and environmental benefits.
- Contribution to achieving the policy targets of the European Green Deal, circular economy action plan, EU bioeconomy strategy and the European industrial strategy at local, regional, national, European and international levels.

Scope: In the context of this topic, a circular systemic solution is defined as demonstration project for deploying a circular and climate-neutral economy at urban and/or regional scale, involving key stakeholders and, ideally, addressing more than one product value chain. Proposals are expected to implement and demonstrate at large scale circular systemic solutions for the deployment of the circular economy (including the circular bioeconomy) in cities and regions or their groupings. They should form part of the implementation of the European Commission's Circular Cities and Regions Initiative (CCRI) and they should be

²⁷³ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/circular-cities-and-regions-initiative_en .

carried out in close coordination and cooperation with the CCRI Coordination and Support Office (CCRI-CSO).

The implemented circular systemic solutions should address economic, social and environmental dimensions of the transition towards a circular economy and include science, technology and governance components. They should demonstrate circular innovative technologies, novel governance and business models and support the active participation of all relevant actors in cities, regions or their groupings. Examples of relevant actors are: public administrations (national/regional/local authorities) and utilities (public/private companies); private sector services and industries, including start-ups and small and medium enterprises (SMEs); research infrastructures, scientific and innovator communities including incubators and accelerators; financial intermediaries with a focus on environmental and social impact; venture capitalists and business angels; civil society, including citizens; and non-governmental organisations and philanthropy.

The implemented circular systemic solutions can address ideally more than one of the key product value chains set out in the new circular economy action plan, i.e.: batteries and vehicles, electronics and ICT, packaging, plastics, textiles, construction and buildings, food, water and nutrients.²⁷⁴ The circular systemic solutions may also include nature-based solutions. Circular systemic solutions and the economic sectors involved in them should be selected and based on a detailed analysis of the cities, regions or their grouping's socio-economic and environmental needs to be addressed, circular potential to be exploited and challenges to be tackled.

Circular systemic solutions should identify, analyse and, when feasible, quantify the economic, social and environmental benefits and trade-offs/challenges related to their implementation and demonstration. They should include the monitoring and evaluation of the transition towards a circular economy, identify their strengths and weaknesses as well as causes. They should analyse the encountered regulatory obstacles and drivers and provide clear and precise policy recommendations to improve circular economy. Each circular systemic solution should address environmental externalities and contribute to preserving and, where possible, increasing the well-being and the health conditions of the local communities involved in the transition towards a circular economy.

It is crucial that the circular systemic solutions implemented and their business models have a high replicability and scalability potential. This is fundamental to facilitate that circular systemic solutions demonstrated in specific areas should be replicated in others. During their implementation and by the end of their life cycle, the selected proposals are expected to share with all stakeholders clear and comprehensive guidelines on the circular systemic solutions adopted, including their strengths and challenges. They should also provide information on key barriers identified to avoid their emergence at early stages of replicating existing solutions. Proposals should ensure that all evidence, information and project outcomes will be accessible through the CCRI website (incl. business models and other studies).

²⁷⁴ <https://ec.europa.eu/environment/circular-economy/>.

It is essential that proposals also ensure complementarity and cooperation with existing and future relevant European projects on the circular economy and the circular bioeconomy, with special reference to those on local and regional scale and avoid overlaps and repetition²⁷⁵.

Citizen science could be appropriate mode of research to increased practices and participation of citizens in circular systemic solutions.

Where relevant, SSH and social innovation aspects should be considered.

HORIZON-CL6-2023-CircBio-02-2-two-stage: Novel, sustainable and circular bio-based textiles

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 14.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will contribute to expected impacts under the Destination ‘Circular economy and bioeconomy sectors’, in line with the European Green Deal, the EU bioeconomy strategy and its action plan, the EU biodiversity strategy for 2030, the circular economy action plan (CEAP), the chemicals strategy for sustainability, the EU

²⁷⁵ Such as, projects under the Horizon Europe topic [HORIZON-CL6-2021-CIRCBIO-01-01: Circular Cities and Regions Initiative \(CCRI\)’s circular systemic solutions](#), and Horizon 2020 European Green Deal call’s topic [LC-GD-3-2-2020: Demonstration of systemic solutions for the territorial deployment of the circular economy](#).

textiles strategy, the EU zero pollution action plan as well as the New European Bauhaus initiative and the EU industrial strategy.

In particular, expected impacts to be addressed by successful proposals include: i) enhancing European industrial sustainability, competitiveness and resource independence; ii) accelerating regional, rural, local, urban and consumer-based transitions towards a sustainable, regenerative, inclusive, just and clean circular economy and bioeconomy as well as iii) the development of innovative and sustainable value-chains in the bio-based sectors, substituting fossil-based ones.

Proposal results are expected to contribute to all of the following outcomes:

- Significantly reduce the negative environmental impact of textiles throughout their lifecycle. This impact encompasses primary raw materials and water consumption, land use and indirect land use change, as well as GHGs and other pollutants emissions (zero pollution), via addressing circularity-by-design and sustainable production aspects (the latter including thus also resource efficiency and circularity of resources improvements).
- Significantly increase recyclability and circularity of textiles; it is estimated that currently there is a very low rate of recyclability of textiles into new textiles, worldwide²⁷⁶.
- Increase the use of EU (locally/regionally-sourced) alternative, bio-based fibres (including the reuse of bio-based textiles in their present form and in novel forms of use).
- Address social impacts (e.g., HS&E and working conditions), in addition to environmental effects; projects should ensure sustainable, circular and socially just textile production and consumption at EU level, while international cooperation is strongly encouraged. The latter will allow for enhancing further on the sustainable production and consumption of textiles while improving on the replication potential of the proposed innovations.
- Empower and increase SMEs participation and improve academia/industry/feedstock & fibres suppliers' interactions and collaboration.
- Establish new and innovative circular bio-based value chains with a positive impact on EU competitiveness and jobs creation at regional, rural and local levels.

Scope: Overall, the call addresses the design, demonstration and scale-up of production of sustainable and circular, bio-based textiles for one or more applications: e.g., technical textiles, garments, industrial textiles, home textiles; including also innovative smart textiles and those providing additional functionalities (e.g., antimicrobial or fire resistance properties). Blended, but only bio-based compositions, are included hereby.

More specifically, the overall scope should be addressed by the projects via:

²⁷⁶ See [EU Strategy for textiles](#).

- Valorisation of secondary biomass, residues and under-utilised (primary or secondary) biomass (sustainable biomass sourcing, land use, land-use change and forestry (LULUCF) and biodiversity considerations should be addressed/showcased) for bio-based textiles. Moreover, the reuse of fibres from bio-based textiles to produce circular bio-based textiles is in scope;
- Design for circularity, enabling thus material design for durability, end-of-life recyclability, re-use and upcycling (including usability of waste fibres), with attention to the final application(s)/end use of textiles;
- Design for end-product quality, safety, and durability, with consideration of the sustainability and circularity of textiles value chains and the final application/end-use; this does include preventing micro- and nano- plastics/fibres release throughout the lifecycle of textiles;
- Development, demonstration and scale-up of novel processes by deploying appropriate enabling technologies²⁷⁷ to significantly reduce the environmental footprint of textiles, across their production steps (pre-treatment, mordanting, dyeing, and finishing steps), improving notably on climate neutrality and against zero pollution. Moreover, apply industrial, industrial-urban and other symbiosis concepts, where necessary to achieve and enhance targeted outcomes and impacts;
- Assess the environmental and social sustainability performance of the proposed innovations (textiles production and textiles lifecycle), while including technoeconomic feasibility assessment as well. The methodologies of assessment should follow existing EU standards;
- Integrate the Safe-and-Sustainable-by-Design (SSbD) framework, developed by the Commission, for assessing the safety and sustainability of chemicals and materials.²⁷⁸ Contribute with and develop recommendations that can advance further the application of the SSbD framework. More specifically, provide thresholds that can support the criteria definition and improvements for the assessment SSbD methodologies, including any specificities related with bio-based textiles. Recommendations can also include identification of data gaps, especially safety, environmental, but also socio-economic factors, as well as priorities for data collection.
- Address, consumer behaviour, acceptance and demand aspects for circular and sustainable bio-based textiles;
- Assess existing barriers to implementing circular economy business models for textiles; on this basis create innovative, sustainable and circular business models for the (EU and

²⁷⁷ Including deploying enabling technologies e.g. industrial biotechnology, enabling digital technologies etc. (examples are non-exhaustive).

²⁷⁸ See documents defining the SSbD framework and criteria on: https://research-and-innovation.ec.europa.eu/research-area/industry/key-enabling-technologies/advanced-materials-and-chemicals_en.

local) production and consumption of circular bio-based textiles. The participation of industry and particularly SMEs is strongly encouraged.

Projects are also expected to contribute to the New European Bauhaus (NEB) initiative by interacting with the NEB Community, NEB Lab and other relevant actions of the NEB initiative through sharing information, best practice, and, where relevant, results.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded research projects, (Horizon 2020, LIFE, Horizon Europe) including the ones under the Circular Bio-based Europe JU (CBE JU) and other partnerships of Horizon Europe.^{279,280}

Proposals should also include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.

Social Science and Humanities (SSH), social innovation and international cooperation aspects are also applicable to this topic and it is highly encouraged to address them as cross-cutting issues.

Innovating for sustainable bio-based systems, biotechnology and the bioeconomy

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CircBio-02-3-two-stage: Non-plant biomass feedstock for industrial applications: technologies and processes to convert non-lignocellulosic biomass and waste into bio-based chemicals, materials and products, improving the cascading valorisation of biomass

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately.

²⁷⁹ E.g., see Horizon 2020, CE-FNR-14-2020 call: [Innovative textiles – reinventing fashion](#) - IA (projects HEREWEAR, MY-FI and New Cotton), as relevant. HEREWEAR: Bio-based local sustainable circular wear (ID: 101000632); MY-FI: Reinventing a smart, circular and competitive textile industry with advanced myco-fibres (ID: 101000719); New Cotton: Demonstration and launch of high performance, biodegradable, regenerated new Cotton textiles to consumer markets through an innovative, circular supply chain using Infinited Fiber technology (ID: 101000559). Also BBI JU past and ongoing projects: [GRETE H2020-BBI-JTI-2018](#)- ‘Green chemicals and technologies for the wood-to-textile value chain’, [GLAUKOS H2020-BBI-JTI-2019](#)- ‘Sustainable clothing and fishing gear’. [NEOCEL H2020-BBI-JTI-2015](#) ‘Novel processes for sustainable cellulose-based materials’, [EFFECTIVE H2020-BBI-JTI-2017](#) ‘Advanced Eco-designed Fibres and Films for large consumer products from biobased polyamides and polyesters in a Circular Economy perspective’, [UNLOCK H2020-BBI-JTI-2020](#) Unlocking a feather bioeconomy for keratin-based agricultural products, [AllThingsBio H2020-BBI-JTI-2019](#) (for the fashion and textile aspects – consumers awareness and participation).

²⁸⁰ See also: HORIZON-CL6-2024-CIRCBIO-01-2: ‘Circular solutions for textile value chains based on extended producer responsibility’, HORIZON-CL6-2024-CIRCBIO-02-1-two-stage: ‘Circular solutions for textile value chains through innovative sorting, recycling, and design for recycling’ and HORIZON-CL6-2023-ZEROPOLLUTION-02-2-two-stage: ‘Safe-and-sustainable-by-design bio-based platform chemicals, additives, materials or products as alternatives’.

<i>project</i>	Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will contribute to expected impacts under Destination ‘Circular economy and bioeconomy sectors’, related to consumers and industry, and in line with: the European Green Deal, the circular economy action plan, EU biodiversity strategy for 2030, the EU bioeconomy strategy & its action plan, the Waste Framework Directive and the EU industrial strategy.

In particular, expected impacts to be addressed by successful proposals include: i) developing innovative and sustainable value-chains in the bio-based sectors and ii) enhancing European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to all of the following outcomes:

- Increased sustainability of biomass resources valorised in industrial applications, lowering land dependence and Indirect Land Use Change (ILUC) impacts, protecting biodiversity and respecting ecosystems integrity;
- Contribution to climate-neutrality (primarily via reduction of greenhouse gas emissions, and accessorially via increase of carbon removals),²⁸¹ zero pollution and resource efficiency via practical application of the circular (bio)economy concept;
- Improved industrial competitiveness, strategic autonomy and resource independence of bio-based value chains of EU Member States and/or Associated Countries, due to more sustainable industrial products and practices.

²⁸¹ [Sustainable Carbon Cycles](#) communication.

- Environmental, economic and social benefits on territorial and municipal level, due to increased circularity and upcycling of low-value, Non-Lignocellulosic Biomass (NLBM) (waste), of terrestrial or aquatic origin, including its upcycling into high-value applications.
- SMEs engagement, including the regional dimension, for skilled jobs creation.
- Increased cooperation and awareness across circular bio-based value chains, including waste managers, biomass feedstock providers, bio-based (process) industry, end-users and the civil society.

Scope: Circular bioeconomy will rely on the availability of diversified and low/no-ILUC (Indirect Land Use Change) sources of biomass but also on the ability to design, develop and scale-up processes to valorise such feedstock towards high-value, sustainable bio-based products. Non-Lignocellulosic Biomass (NLBM),²⁸² and related residual non-lignocellulosic biomass', provide options beyond plant biomass. However, NLBM from aquatic and terrestrial sources, often face challenges to reach economies of scale and biorefining production intensification, driven also by a complex and varying feedstock composition.

Project activities should address:

- Identification and optimization of suitable NLBM feedstock, with focus on higher resources efficiency and circularity, while respecting the waste hierarchy principles. Such feedstock to be deployed in adequate production systems, including upcycling approaches. More specifically, design and develop innovative upstream and conversion processes at pilot scale (e.g., via application of enzymes, industrial microbial hosts, microbiomes from natural ecosystems and diverse industrial biotech or other appropriate enabling technologies);
- Develop downstream conversion processes, building towards a targeted portfolio of high-value bio-based process outputs / bio-based products that can be later obtained in NLBM integrated biorefineries (of appropriate scale);
- Assessment of the proposed/developed innovative processes against techno-economic feasibility to valorise NLBM (waste) (at different potential biorefinery scales), showcasing/ensuring process flexibility to cope with the composition heterogeneity of the chosen NLBM feedstock(s);

²⁸² For non-lignocellulosic (NLBM), non-plant biomass & NLBM waste in scope, main examples include: Agri-food residues and waste (incl. food waste), marine and aquaculture residues and waste chitinous biomass; municipal solid waste (organic fraction); livestock waste by-products (such as feathers and bones).

Note 1: For waste or mixed feedstock (e.g. food waste) where lignocellulose can be a minor/small fraction, this can be in scope. Note 2: micro- and macro-algae are excluded, as this type of feedstock is dealt under Destination 3 - Heading 3: 'Innovating for blue bioeconomy and biotechnology value chains'. Manure and sewage sludge are also out of scope of this topic (please see Destination – Clean environment and zero pollution, Destination – Fair, healthy and environment-friendly food systems from primary production to consumption and Destination – Clean environment and zero pollution).

- Application of ex ante life-cycle assessment methodologies to ensure gains in environmental performance (including biodiversity), but also socio-economic aspects, as well ensuring safety for the consumers and operators;
- Enable participatory approaches and knowledge sharing across circular bio-based value chains. This includes feedstock providers (rural, coastal, urban and peri-urban dimensions, as appropriate), bio-based (process) industry, end-users and the civil society, aiming for a comprehensive scoping of challenges (multiple dimensions) and opportunities of valorising NLBM and NLBM waste.
- Production of biofuels and bioenergy, as the main production focus, falls outside the scope of this topic (their co-production, while following the cascading biomass use principles, is not excluded though). Food/feed ingredients, cosmetics-related compounds and especially those with health-promoting properties (nutraceuticals), may be in scope, provided their toxicological and nutritional safety has been assessed and guaranteed at EU level.

Where relevant, proposals should seek links and synergies as well as capitalise on the results of past and ongoing EU research projects under Horizon 2020, LIFE and Horizon Europe (especially under the Bio-based Industries Joint Undertaking (BBI JU) / Circular Bio-based Europe Joint Undertaking (CBE JU))²⁸³.

Proposals should also include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.

Social sciences and humanities (SSH) and social innovation aspects should be considered for this topic.

Call - Circular economy and bioeconomy sectors

HORIZON-CL6-2024-CIRCBIO-01

Conditions for the Call

Indicative budget(s)²⁸⁴

Topics	Type of	Budgets (EUR	Expected EU contribution per	Indicative number
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²⁸³ See also complementary topic HORIZON-CL6-2023-CIRCBIO-01-4: ‘Land-based bioprospecting and production of the bioactive compounds and functional materials for multiple bio-based value chains’ and also HORIZON-CL6-2023-CIRCBIO-01-05: Broadening the spectrum of robust enzymes and microbial hosts in industrial biotechnology.

²⁸⁴ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

	Action	million)	project (EUR million) ²⁸⁵	of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-CircBio-01-1	CSA	6.00	Around 6.00	1
HORIZON-CL6-2024-CircBio-01-10	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-CircBio-01-2	IA	14.00	Around 7.00	2
HORIZON-CL6-2024-CircBio-01-3	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-CircBio-01-4	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-CircBio-01-5	RIA	8.00	Around 4.00	2
HORIZON-CL6-2024-CircBio-01-6	RIA	6.00	Around 3.00	2
HORIZON-CL6-2024-CircBio-01-7	IA	6.00	Around 6.00	1
HORIZON-CL6-2024-CircBio-01-8	CSA	3.00	Around 3.00	1
HORIZON-CL6-2024-CircBio-01-9	CSA	2.50	Around 0.80	3
Overall indicative budget		74.50		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General

²⁸⁵ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

	Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling a circular economy transition

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CircBio-01-1: Circular Cities and Regions Initiative’s project development assistance (CCRI-PDA)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The following additional eligibility criteria apply:</p> <p>Proposals funded under this topic, and their circular systemic solutions, must form part of the demonstration projects for the implementation of the European Commission’s Circular Cities and Regions Initiative (CCRI). This means that:</p> <ul style="list-style-type: none"> • Proposals must cooperate with CCRI and its Coordination and Support Office by means of sharing with this initiative knowledge and experiences developed during the implementation of the project; these must be included in the Work Plan; • Proposals must participate in the CCRI’s events; these must be included in the Work Plan; <p>Applicants must integrate explicitly these obligations into their proposal’s work plan.</p>
<i>Legal and</i>	The rules are described in General Annex G. The following exceptions

<i>financial set-up of the Grant Agreements</i>	apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁸⁶ .
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Expected Outcome: The successful proposal will support the delivery of solutions to implement the European Green Deal, the circular economy action plan (CEAP) and the bioeconomy strategy. The topic will support the transition towards a sustainable, regenerative, inclusive and just circular economy across regions of Europe at local and regional scale.

The Circular Cities and Regions Initiative’s Project Development Assistance (CCRI-PDA) projects are part of the implementation of the European Commission’s Circular Cities and Regions Initiative (CCRI)²⁸⁷. They will be carried out in close coordination and cooperation with the CCRI Coordination and Support Office (CCRI-CSO).

Investors and lenders need to gain more confidence in investment projects in the field of circular economy which are still seen as risky. European added value can be achieved, for example, where projects introduce innovation to the market regarding financing solutions minimising transaction costs and engaging the private finance community. European added value could also be achieved where projects demonstrably address legal, administrative and other market opportunities and challenges for innovative and sustainable circular economy investment schemes.

Projects results are expected to contribute to all the following expected outcomes:

- Delivery of a series of sustainable circular economy projects;
- Roll-out of innovative financing solutions/schemes at local and regional scale across Europe.

Scope: The CCRI-PDA service targets public and private project promoters such as local and regional authorities or their groupings, public/private infrastructure operators and bodies, utilities and services, industry (including SMEs).

The purpose of the CCRI-PDA is to help project promoters develop their circular economy proposals at local and regional scale by bringing together the technical, economic and legal expertise.

²⁸⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

²⁸⁷ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/circular-cities-and-regions-initiative_en

The CCRI-PDA should provide support for those activities necessary to prepare and mobilise finance for investment projects, such as feasibility studies, stakeholder and community mobilisation, business plans and preparation for tendering procedures or setting up a specific financing scheme/financial engineering.

The CCRI-PDA should focus on activities aimed at increasing circularity in product value chains that are relevant for the transition towards a sustainable circular economy at local and/or regional scale. The economic sectors and investment proposals involved in each CCRI-PDA service should be clearly specified and selected according to local and/or regional circular economy needs, resources and potential. This selection should be clearly justified and explained.

Ideally, the proposed investments should be launched before the end of the project, which means that proposals should result in signed contracts with investors for circular economy investments at local and regional scale to that effect. Furthermore, the proposals should provide tangible showcases that trigger further market replication.

In addition, proposals should also include an exemplary/showcase to increase circularity in specific sector(s) at local and regional scale and/or in the size of the expected investments and leverage factors²⁸⁸;

In addition, all proposals should demonstrate a high degree of replicability and include a clear action plan to communicate experiences and results to potential replicators across EU Member States and Associated Countries.

Indicatively, the CCRI-PDA focuses on small and medium-sized circular economy investments of up to EUR 20 million²⁸⁹ (for a single proposal or a portfolio of proposals).

The EU contribution per proposal should not exceed 10% of the related investment.

Proposals should justify the budget for the project development assistance needed based on the expected investment portfolio to be set up. This includes the amount of investments that is expected to be triggered and the respective leverage factors to be achieved.

Proposals are expected to ensure synergies and complementarities with other EU financial schemes for circular economy projects. Proposals should ensure that all evidence, information and project outcomes will be accessible through the CCRI website (incl. business models and other studies).

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

²⁸⁸ i.e. amount of investments in the circular economy triggered per each EUR of Horizon Europe support.

²⁸⁹ The Circular Economy Technical Assistance Facility (CETAF) will focus on projects and programmes with a minimum total investment volume of EUR 20 million.

HORIZON-CL6-2024-CircBio-01-2: Circular solutions for textile value chains based on extended producer responsibility

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 14.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) enhance European industrial sustainability, competitiveness and resource independence, and ii) improve on consumer and citizen benefits.

Proposal results are expected to contribute to all the following outcomes:

- Recommendations on best innovative solutions for the identification of material composition of used textiles/textile waste embedded in the design of textile products;
- Recommendations on design for recycling for textile products that allows the use of targeted Extended Producer Responsibility (EPR) schemes;
- Recommendations on policy tools to reach EU greenhouse gas reduction targets till 2050 (climate neutrality), including the 2030 target.

Scope: Textiles are the fourth highest-pressure category for the use of primary raw materials and water and fifth for greenhouse gas emissions and a major source of microplastic pollution in production and use phases. They are also a key material and product stream in the circular economy action plan. Improvements in the circularity of the textile value chains will help reduce GHG emissions and environmental pressure. EPR schemes are a lever for circularity.

The purpose of this topic is to enable the optimal functioning of EPR schemes for textiles within the EU and to take into account the commitments of the textile strategy on EPR. The circular economy action plan establishes the policy objective to make the textiles sector more sustainable by boosting the circularity of textile consumption i.a. through reuse, separate collection, sorting and recycling of textiles. It also wants to limit textile waste generation and restrict exports of waste that have harmful environmental and health impacts in third countries or that can be treated within the EU. Furthermore, increased amounts of separately collected textile waste are expected because of the Waste Framework Directive’s obligation to separately collect textiles as of 2025.

Extended Producer Responsibility (EPR) schemes have proven to be an effective tool for improving the treatment of other waste streams and therefore are being considered as necessary in recent consultations by the stakeholders of the textile sector. In view of that, the Commission is assessing the feasibility of introducing EPR for textiles into EU legislation. Proposals should aim to support the high-quality separate collection, preparation for treatment and treatment of used textiles and textile waste, thereby enabling the optimal functioning of EPR schemes in this sector. It will do so by providing recommendations on improving the ease of identification of material composition in a wide range of used textile products/waste to inform the different actors in the use and end-of-life stages of textiles (consumers for use and disposal, social enterprises to enable reuse, waste management operators to enable preliminary treatment and treatment operations). To do so, it will inter alia identify, develop and test innovative labelling of textile products (including through the use of technologies such as AI, blockchain or Internet of Things) to ease separate collection for re-use or end-of-life treatment that leads to high quality secondary raw materials.

Proposals should bring together different stakeholders active in the sector along the value chain, such as waste collectors, waste sorters, repair and reuse organisations. Proposals should also try to address historical liabilities and the impact of textiles coming from outside the EU. Proposals should analyse how EPR schemes can improve the circularity of textiles, assess the material composition in a wide range of used textile products and waste with a view to targeted EPR schemes for improved collection and recycling, and test separate collection options for reuse or end-of-life treatment that could be enforced through EPR schemes. Projects should also identify novel solutions for textile reuse. They should also consider possible rebound effects and only propose measures that will not hamper the market uptake of more sustainable novel textile materials. Projects should also recommend/identify/define tools (policy, legislation, governance, market-based, etc.) that the EU institutions (Commission, Parliament, Council of the EU) could implement or propose in order to reduce the overall greenhouse gas (GHG) emissions from the textile sector (including from final consumption, not only production) in the EU in line with the EU greenhouse gas emissions reduction targets till 2050 (climate neutrality), including the 2030 target; for this, the projects should take into account the relevant possible rebound effect.

The targeted TRL at the end of the projects is 6 to 8.

HORIZON-CL6-2024-CircBio-01-3: Innovative circular solutions for furniture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.

<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) enhance European industrial sustainability, competitiveness and resource independence, and ii) improve on consumer and citizen benefits.

Proposal results are expected to contribute to all of the following outcomes:

- Increased deployment and demonstrated benefits of advanced digital solutions (e.g., through AI, robotics, IoT, blockchain) in circular businesses including waste management and recycling
- Emergence of new value chains using upcycled, recycled and/or biobased;
- resources, e.g. through industrial symbiosis, with particular attention to SMEs;
- Increased recycling rates and upcycling to new higher-value products;
- Increased uptake of recycled and/or renewable material;
- Increased deployment and market uptake of circular design, including design for easy maintenance, repair, remanufacturing and recycling;
- Increased reuse, refurbishment and remanufacturing rates and diffusion of new circular business practices, in particular in the uptake of repair, reuse, refurbishment and remanufacturing;
- Increased resource efficiency along and across value chains, causing a measurable reduction in GHG emissions, release of microplastics, other environmental pollution, and in the use of hazardous substances, and an increase of carbon removals.

Scope: Predominantly consisting of SMEs, the EU furniture industry employs around one million European workers and manufactures approximately a quarter of the world’s furniture, representing a EUR 84 billion market equating to an EU28 consumption of ~10.5 million tons of furniture per annum. Despite a notable degree of knowledge and awareness of CE principles, analyses conducted in the framework of luxury furniture show that the involvement of furniture companies in CE practices, in particular those concerning reuse and recycle actions, is still marginal, and very limited use of process and product certifications has been noted.¹⁷⁹ According to the findings of an EU-funded project¹⁸⁰, furniture waste in the EU accounts for more than 4% of the total municipal solid waste stream. Waste arising from commercial sources is assumed to contribute 18% of total furniture waste generation across the sector. Total annual EU furniture waste equates to 10.78 million tonnes. According to European Federation of Furniture Manufacturers statistics, 80% to 90% of the EU furniture waste in MSW is incinerated or sent to landfill, with ~10% recycled. Reuse activity in the

sector is considered low. Where reuse does occur, it is mostly through commercial second-hand shops, social enterprise companies or charities.

Six key cycles can be highlighted to make furniture more circular. All proposals should target several of these cycles:

- Maintain – using preventative maintenance to maximise product lifetime, e.g., a chair remains a chair;
- Repair – corrective maintenance, e.g., a chair remains a chair;
- Reuse – redistributing products through a change in ownership, e.g., a chair remains a chair;
- Refurbish or remanufacture products to optimize lifetime, e.g., by resizing a desk or changing the appearance of a chair through re-upholstering to extend ‘fashion’ service life, or resizing desks;
- Repurpose – change functionality of the product, e.g., a desk becomes a table;
- Recycle – recovering the value of components and materials for feedstock as secondary materials in new products.

Key strategies to achieve the circularity transition are circular design including the smart use of biobased materials, a shift from products to services, extended product life through design, safe and circular material choices, increased material efficiency, and modular design. It is evident that circularity concepts must be anchored in the design phase of products and aim at the user. All proposals should therefore address to some extent circular design strategies.

Projects should demonstrate and deploy at large scale innovative solutions and designs for increased quality, non-toxicity and durability of secondary and renewable materials and increased share of secondary and renewable materials in new products. Projects should demonstrate increased recovery, recycling and upcycling rates and a higher uptake of secondary materials for high value applications. Projects should also demonstrate circular business practices, in particular in the uptake of repair and reuse, remanufacture, product-service-systems, and in the full lifetime of products or services. To achieve this, targeted market size, economic feasibility, cost efficiency and social acceptance need to be addressed. To break down the barriers for this transition, it is important that proposals involve and address the different perspectives of all relevant actors, e.g., manufacturers, retailers, consumers and Civil Society Organisations (CSOs). Proposals should consider the use of digital solutions (including technologies such as AI, robotics, IoT and blockchain) in particular with a view to the implementation of the digital product passport, and demonstrate their benefits for increased circularity. They should also help produce harmonised and robust methods to assess the amount of recycled content in sectoral products, which is key for a future review of green claims through authorities and consumer organisations. Environmental, social and economic impacts should be assessed from a lifecycle perspective as product, organisation and consumption environmental footprints, using the respective methods

developed by the European Commission (Product Environmental Footprint, PEF, should be used for the assessment of the environmental impacts) and through costing methods and a dynamic LCA; relevant data should be fed into the European Platform on Life Cycle Assessment, following the specific Environmental Footprint data and format requirements. The functional performance of technologies and secondary materials can be assessed through the EU Environmental Technology Verification (ETV) scheme. Considering the microplastics and microfiber pollution and hazardous substances that are present in the targeted waste streams, their removal from the materials used for the products in concern as well as from the recovered material is crucial, in addition to applying less-polluting production and consumption procedures. Decontamination levels need to be properly addressed and accumulation prevented. Proposals should fully incorporate the Safe and Sustainable by Design (SSbD) approach. All results should be validated using quantitative indicators and targets wherever possible.

Proposals should also envisage policy recommendations for increased warranty and cascading use. They should also provide for the development of training material to endow workers in this occupational group with the right skillset in order to deploy the new technologies developed. Proposals should consider the development of learning resources for the current and future generations of employees, with the possibility to integrate them in existing curricula and modules for undergraduate level and lifelong learning programmes. The projects should provide contributions to relevant standards or best practices.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

To the extent that proposed solutions will address the role of the consumer, proposals should seek to contribute to the goals and cooperate with the services of the European Commission's Circular Cities and Regions Initiative (CCRI). Joint activities with CCRI projects are encouraged.

The targeted TRL at the end of the projects is 6 to 8.

HORIZON-CL6-2024-CircBio-01-4: Systemic circular solutions for a sustainable tourism

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) accelerate regional, rural, local/urban and consumer-based transitions, ii) enhance European industrial sustainability, competitiveness and resource independence, and iii) improve on consumer and citizen benefits.

Project results are expected to contribute to all the following outcomes:

- Diffusion of circular tourism services, where the use of harmful substances and the generation of waste is minimised and the use of energy, land and water is efficient;
- Deployment of replicable systemic solutions for cities and regions, where circularity is ingrained in the service design, whether for the use of residents or visitors, taking into account the specific needs of the territory (urban, rural, peripheral);
- Increased circular, zero-pollution and climate-neutral practices among providers and users of tourism services and active participation of users in circular systemic solutions;
- Deployment of innovative solutions and new, affordable technologies (including digital technologies such as AI, robotics, IoT and blockchain) that support transformation towards circularity for all actors on different systemic levels;
- Creation of jobs that facilitate circularity for different sectors, serving those who are living in or visiting cities and regions;
- Uptake, replication and visibility of circular systemic solutions for sustainable tourism that contributes economically, socially and environmentally to the achievement of the targets of the European Green Deal, circular economy action plan, bioeconomy strategy, industrial strategy and EU agenda for tourism, at local, regional, national and European levels.

Scope: Proposals are expected to implement and demonstrate circular systemic solutions at the level of cities and regions, and include several sectors providing services for visitors and residents such as hospitality, transportation, culture, attractions, nature-based activities.

Tourism can consume large quantities of energy, water, and plastics, which degrade the environmental quality of destinations and ecosystems, affecting the lives of residents. Circular tourism should consider waste and water management, batteries and vehicles, electronics and ICT, packaging, plastics, construction and buildings, GHG emissions of local and long-distance mobility, accommodation and food services.

Proposals should address at least one of these above mentioned sectors.

The complexity of tourism ecosystem lies in the fact that industry is deeply interlinked with and dependent on multiple key resource and commodity chains. Travel and tourism actors can both act as enablers of circularity in a wider economic context, and at the same time benefit from circularity models in other industrial ecosystems. Proposals should develop and demonstrate new and circular business models and technological solutions to change the way

tourism operates, enabling businesses and destinations to be sustainable. This includes developing systemic approaches that steer the behaviour of consumers, whether residents or citizens, towards circularity and makes them participate in circular practices.

The implemented circular systemic solutions should address economic, social and environmental dimensions of the transition towards circular tourism and include science, technology, behavioural and governance components. Proposals are expected to involve the relevant actors, which include public administrations, destination management organisations, private sector services and industries, citizens (residents and visitors), non-governmental organisations and new types of actors rising from collaborative economy platforms.

The development of systemic solutions needs to consider the costs of transition from the existing models into the new ones, analysing trade-offs and challenges related to their implementation and demonstration. As the tourism ecosystem is mostly composed of small actors, micro and SMEs, systemic solutions at the level of cities and regions should develop and test innovative and collaborative ways to create common objectives, targets and processes. The implementation of technologies such as AI, robotics, IoT and blockchain could also be considered in a context-sensitive manner. Proposals should however also investigate simple, low-cost and low-tech solutions. Projects should analyse the encountered obstacles and drivers and provide clear and precise policy recommendations for local authorities on how to improve circular tourism. Each circular systemic solution should address social, economic and environmental externalities and contribute to the well-being of the local communities while improving the circularity behaviour of the visitors.

The circular systemic solutions implemented and their business models should demonstrate a high replicability and scalability potential in order to contribute to the overall transition of tourism towards more sustainable and resilient practices. During their implementation and by the end of their lifecycle, the selected proposals are expected to prepare and share clear and comprehensive guidelines on the circular systemic solutions adopted, including their strengths and weaknesses experienced, mainly for the use of economic operators in the sector.

With regard to the territorial aspects of all proposed solutions, proposals should seek to contribute to the goals and cooperate with the services of the European Commission's Circular Cities and Regions Initiative (CCRI). Joint activities with CCRI projects are encouraged.

The targeted TRL at the end of the projects is 6 to 8.

Innovating for sustainable bio-based systems, biotechnology and the bioeconomy

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CircBio-01-5: Programmed biodegradation capability of bio-based materials and products, validated in specific environments

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁹⁰ .

Expected Outcome: Successful proposals will enable the bio-based industries in the Union to contribute to the enhancement of European industrial sustainability, competitiveness and resource independence and to the development of innovative and sustainable value-chains in the bio-based sectors. Projects results will contribute to deliver bio-based solutions with reduced environmental impacts on soil, water, and air quality, biodiversity and climate, in line with the EGD objectives, the EU circular economy and the EU zero pollution action plans.

Projects results are expected to contribute to all of the following expected outcomes:

- Circular design of bio-based technologies and products: decreasing environmental impacts on soil, water, and air quality, biodiversity and climate, increasing durability and suitability of products to be safely re-used and re-manufactured, allowing for high-quality recycling and for biodegradability.
- Innovative manufacturing processes to enable programming the safe biodegradation of bio-based materials and products according with the environmental conditions and time frame for specific applications.
- Information and labelling of bio-based materials and products with biodegradability capacity for specific applications and end-of-life options.

²⁹⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Scope: The amount of waste littered in the open environment and causing pollution from harmful substances released from such waste streams, such as from plastic littering, has reached the level of a global emergency, especially affecting soil and water quality and biodiversity in land and marine environments. The overall low level of recycling of many waste streams, including collected plastic waste, is also part of such global pollution challenge. Biodegradability of materials and products for targeted applications may offer viable end-of-life solutions in case of safe and sustainable biodegradation either in open environments or under controlled conditions, i.e., in composting plants and anaerobic digestors.

To deliver biodegradable bio-based solutions that address the global pollution challenges effectively, proposals should:

- Analyse those cases of uncontrolled waste littering in the open environment, particularly of plastic waste leading to pollution from nano- and micro-plastics and other contaminants released by macro-plastics, and the corresponding safe bio-based applications where biodegradation in open environments could enable safe and sustainable end-of-life options, e.g., in humanitarian contexts ²⁹¹ where waste management systems for collection, sorting and recycling are not feasible.
- Select applications for biodegradable non-single-use/single-use bio-based materials and products. Such applications should include materials and products which are biodegradable in open environments in those cases of uncontrolled waste littering, as treated in the previous point, and/or other items that may bring some environmental benefits from being biodegradable, for example in cases where products and materials are contaminated from food or from other organic substances during their use;
- Develop manufacturing technologies of such bio-based materials and products with targeted performances: i) decreased carbon footprint (based on the reduction of greenhouse gas emissions and on the increase of carbon removals) and environmental impacts of the production processes; ii) improved circular life extension through predictive maintenance, suitability to be safely re-used and re-manufactured, allowing for recycling, and programmed integrity/biodegradation in specific environments, depending on the application, either in controlled environment (i.e. aerobic digestion in composting plants, anaerobic digestion producing biogas) and in open environments, including in extreme environments in terms of physical conditions; iii) safe biodegradation in the specific environments as in point ii), especially considering the eco-toxicity and any impacts on natural ecosystems from biodegraded materials and from their additives and other components;
- Use innovative and adapt existing AI-based and other digital solutions to optimise the circular lifecycle of products and make it more environmentally and economically sustainable;

²⁹¹ See the projects developed under the topic HORIZON-CL6-2023-CircBio-01-6: ‘Bio-based solutions for humanitarian applications’ for the scoping of the applications in humanitarian contexts.

- Validate tests of biodegradability of bio-based materials designed for specific applications both in controlled and in open environments, e.g., soil and water, under ranges of physical/chemical conditions including extreme conditions. The tests should include the monitoring of the time-frame of partial up to full biodegradation and the environmental impacts in case of biodegradation in open environments, including ecotoxicity and any impacts on biodiversity;
- Provide insights into the development of information and labelling systems to inform users on the most appropriate applications and on the correct use and end-of-life disposal options for the materials and products within the scope. Transparent information should aim at improving the societal acceptance of bio-based innovation and at supporting consumers and customers in making responsible and informed choices. Information should include the assessment of the risks and environmental impacts, including on ecosystems, from an uncontrolled disposal and from littering into the open environments;
- Assess the overall economic feasibility of the manufacturing of the materials and products within the scope.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects, including under the Circular Bio-based Europe JU, the Processes 4 for Planet partnership and other European partnerships of Horizon Europe.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

In order to achieve the expected outcomes of this topic, international cooperation is encouraged.

HORIZON-CL6-2024-CircBio-01-6: Digital information systems for bio-based products

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions

<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5 – see General Annex B.
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Expected Outcome: Successful proposals will support the bio-based industries and the enablers of the digital transition in the Union to contribute to the development of innovative and sustainable value-chains in the bio-based sectors. Projects' results will contribute to deliver bio-based solutions with reduced environmental impacts on soil, water, and air quality, biodiversity and climate, in line with the EGD objectives, the EU circular economy action plan and its sustainable product initiative, the EU sustainable product initiative²⁹² and the proposal for the Ecodesign for Sustainable Products Regulation²⁹³ as well as the EU data strategy²⁹⁴.

Projects results are expected to contribute to the following expected outcome:

- Mobilising the potential of digitalisation of bio-based sectors enabling efficient, sustainable and climate neutral production processes and transparent information.

Scope: An effective circular economy needs improved information of material flows used in all economic sectors. Information and data on products and services are key factors to improve their production's sustainability and to meet the performance demands and needs of customers. Sharing data in an accessible and simple way, according to FAIR principles, to enable easy processing, can provide information back to the society, facilitating the inclusiveness of economic activities. Digital technologies can track and report the journeys of products, components and materials and make the resulting data securely access.

The circular economy action plan's sustainable product initiative, the Ecodesign for Sustainable Products Regulation and the EU data strategy provide guidelines to build data and system architectures aiming at improving products sustainability, resources efficiency and circularity, among other goals.

To exploit the potential of digitalisation for the objectives of the EU circular economy in the bio-based sectors, proposal should:

- Design solutions for the digitalisation of information from bio-based products and their value chains, e.g., AI-based, such as digital passports, tagging and watermarks, etc. and enable their use;
- Specialize the information from bio-based products on impacts on climate, based on estimates of carbon emissions and carbon removals, environmental impacts on soil, water, and air quality and biodiversity, end-of-life options, safety control, technical

²⁹² COM/2020/696 final COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL New Consumer Agenda Strengthening consumer resilience for sustainable recovery.

²⁹³ COM(2022) 142 final Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC.

²⁹⁴ https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en.

performances, predictive maintenance, and programmed integrity/biodegradation, among other data;

- Design the information from bio-based products to improve the societal readiness adaptation in terms of acceptability, and uptake of innovations by society. The information should be easily accessible by customers and consumers and to support them in making responsible and informed choices;
- Support the harmonisation and interoperability of the digital information formats;
- Enable bio-based industries to participate in the European Dataspace for Smart Circular Applications;
- Design the interfaces between the digital information from bio-based products and other applications of digital technologies ensuring interoperability in the Union.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects, including under the Circular Bio-based Europe JU.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Moreover, the link between digitalisation and the resilience of economies to disruptions, such as the one suffered from COVID-19 crisis, should be part of the societal impacts assessment.

HORIZON-CL6-2024-CircBio-01-7: Demonstrating the fair and just transition from GHG-intensive economies facing challenges towards circular bioeconomy model regions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.

Expected Outcome: Successful proposal will contribute to the expected impacts of the Destination ‘Circular economy and bioeconomy sectors’ and the European policies it supports. In line with the European Green Deal priorities, the EU’s climate ambition for 2030 and 2050, the objectives of the EU biodiversity strategy for 2030, and the vision of a society that acts within environmental and social boundaries as defined in the bioeconomy strategy, the successful proposal will guide and facilitate the green transition towards a circular bioeconomy model, in regions that lag behind in this process.

Projects results are expected to contribute to all following expected outcomes:

- Showcased solutions in 2-3 selected coal mining regions and/or intensive agriculture regions, ensuring geographical coverage of different regions.
- Development of new bioeconomy structures that generate local green growth in regions currently relying on GHG-intensive economic activities, focusing on coal mining and/or intensive livestock or crop production in agriculture;
- Strengthened interactions and coordination between affected European / Associated Countries regions.

Scope:

- Demonstrate just and fair bioeconomy solutions in regions that face difficulties in the green transition to leave no person and no place behind.
- Interact with and draw on the logistical support of the CSA “Supporting the fair and just transition from GHG-intensive economies facing challenges towards circular bioeconomy model regions” with the overall goal to demonstrate the transition to a just and fair bioeconomy for in 2-3 selected coal mining regions and/or intensive agriculture regions.
- Demonstrate the feasibility of transforming regions towards sustainable and resource-efficient bioeconomy models, while highlighting the achievement of climate targets, as well as assessing trade-offs (e.g., food security or energy-security, strategic autonomy).
- Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.
- Implement the required multi-actor approach by involving a wide diversity of bioeconomy actors and conducting trans-disciplinary research.
- Where relevant, activities should build and expand on the results of past and ongoing research projects.
- This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

HORIZON-CL6-2024-CircBio-01-8: Bioeconomy project development assistance

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁹⁵ .

Expected Outcome: In line with the European Green Deal priorities, the EU’s climate ambition for 2030 and 2050 and the bioeconomy strategy vision of an economic system that acts within environmental and social boundaries, the successful proposal will improve the deployment of sustainable bioeconomy business models and solutions, which will help rural and coastal areas in achieving a just, green transition.

Projects results are expected to contribute to all following expected outcomes:

- Increased access to financial, legal and technical support along all Technological Readiness Levels and whole supply chains for bioeconomy projects, leading to a higher number of successful bioeconomy flagship projects.
- Alignment of actors (primary producers, citizens, innovators, educators, SMEs, industry, national authorities and other actors) and their goals in collaborative ventures on bioeconomy related projects.

²⁹⁵ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Promotion and support of regional and national transitions from existing fossil-based socio-technical systems to bioeconomy-based systems promoting the valorisation of local biological resources and ecosystem services.

Scope:

- Provide technical assistance for bioeconomy project development and facilitate synergies and linkages between different EU and national policy instruments and funding opportunities (e.g., CBE JU, ERDF, CAP, EMFAF, Innovation Fund) and therefore support the deployment of bioeconomy through the streamlining of research, innovation and demonstration. Public, private and joint public-private projects are eligible.
- Bring together and align the goals of primary producers, SMEs, policymakers and other stakeholders in bioeconomy projects along the whole value chain in order to build collaborative partnerships with a strong technical, financial, and legal capacity.
- Provide expertise and consultancy services to promising bioeconomy projects, on small and medium-sized investments at different TRLs, in the area of business model development (including exploring supply chain options), planning, project documentation, feasibility assessment, financial assistance, including links to other EU funding instruments, and legal assistance.
- Explore the barriers faced by novel bioeconomy solutions and provide strategies how to overcome social, financial, legal and policy barriers.
- Projects benefiting from the assistance should contribute to the development of sustainable bioeconomy solutions and have their main activities in one or more of the following areas (a non-exhaustive list): circular and sustainable bio-based sector, including improvements in durability, quality, or resource-efficiency of bio-based products; activities enhancing biodiversity and land-based climate mitigation and adaptation; integration of the benefits of biodiversity and carbon-rich ecosystems in primary production; low footprint food production, processing and distribution, including novel foods; schemes for rewarding land and water managers for the provision of ecosystem services; sustainable fisheries, aquaculture and algae production; nature-based solutions.
- Assisted projects will be selected on the basis of merit. Proportionality of assisted projects across the different bioeconomy sectors as well geographical regions shall be ensured. Special focus should be given to projects from Member States where bioeconomy is underdeveloped.
- The technical support facility is expected to carry out the project assistance activities for the minimum duration of 5 years and be open to projects from all EU Member States and Associated Countries.

- Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.
- The proposals must use the multi-actor approach by involving a wide diversity of bioeconomy actors.
- Where relevant, activities should build and expand on the results of past and ongoing research projects.

HORIZON-CL6-2024-CircBio-01-9: Circular bioeconomy start-up villages

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 0.80 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, one project highest ranked within the area B, and one project highest ranked within the area C, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ²⁹⁶ .
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Expected Outcome: In line with the European Green Deal priorities, the EU's climate ambition for 2030 and 2050, the long-term vision for the EU's rural areas and its flagship initiative on research and innovation for rural communities, the European innovation agenda, the EU biodiversity strategy for 2030, the bioeconomy strategy and its vision of an economic system that acts within planetary boundaries and fosters a just transition, the successful proposal will support the development of circular systemic bioeconomy solutions in start-up villages across Europe. The proposal will contribute to the expected impacts of Destination 3 'Circular economy and bioeconomy sectors', by accelerating rural fair and just transitions, developing innovative and sustainable value-chains and sharing platforms (e.g. Startup Village Forum²⁹⁷).

Project results are expected to contribute to all of the following expected outcomes:

- Development and transfer of the concept of sustainable circular bioeconomy solutions in start-up villages;
- Showcased novel governance and business models for circular systemic bioeconomy solutions in start-up villages or their groupings;
- Strengthened position of bioeconomy start-ups in rural innovation ecosystems for the development of new value-added products, technologies and approaches;
- Enhanced training opportunities and knowledge exchange and cooperation among rural innovators;
- Improved rural innovation ecosystems to build a sustainable bioeconomy within ecological boundaries based on local resources, in particular contributing to climate and biodiversity policies and targets.

Scope: Applicants should demonstrate how they will provide innovative circular, sustainable and socially fair bioeconomy solutions for:

- A. food systems transformation;
- B. bio-based sectors, covering biological waste/residues and bio-based materials and products;

²⁹⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

²⁹⁷ The Startup Village Forum intends to promote knowledge exchange and cooperation activities and to work as an open space where institutions and stakeholders can meet, discuss and shape action for startup-driven innovation in rural areas. Besides, the Forum aims to collect the commitment of public and private organisations to support Startup Villages.

C. employing digital technologies and approaches.

Applicants should address only one of the thematic areas above, and clearly indicate it in their proposal.

Proposals are expected to contribute to the creation and support of a thematic network of start-up villages based on bioeconomy concepts, including all of the following activities:

- Provide assistance and advisory support for the development and linking of startup villages and raise awareness of the rural innovators on sustainable and circular systemic bioeconomy solutions.
- Develop the Start Up Village Forum initiative through a community of practice to support active engagement of all relevant actors (local and regional authorities, entrepreneurs, investors, rural cooperatives, rural communities and others) in the start-up villages and foster knowledge exchange and mutual learning between them, as well as share research, data and analytical findings.
- Develop a list of case studies of local and regional start-up villages focusing on bioeconomy including sustainable food systems and bio-based solutions, identifying and presenting the respective strengths, weaknesses, and opportunities. These case studies could be used for replication and dissemination across Europe in the context of the Startup Village Forum. Proposals should involve at least three start-up villages from three different Member States / Associated Countries, ensuring geographical coverage of different regions.
- Identify the challenges and development pathways for developing and scaling up of start-ups and small and medium-sized enterprises (SMEs) for a sustainable bioeconomy, including businesses linked to agriculture, food, forestry, bio-based innovation and non-agricultural activities in rural areas related to the community-led local development strategies.
- Address the challenges of Europe's fragmented start-up scene and of entrepreneurship education and capacity building.
- Assess possible options and create guidelines and recommendations for policy makers, investors and rural innovators summarizing, sharing and presenting existing best practices and innovations to enable replication of successful cases across Europe.
- The proposals should build on the knowledge and tools already generated by the BioeconomyVentures²⁹⁸ and Pilots4U²⁹⁹ projects developed under Horizon 2020, as well as seek complementarities with related actions and existing³⁰⁰ and upcoming³⁰¹ relevant

²⁹⁸ <https://cordis.europa.eu/project/id/101023260>.

²⁹⁹ <https://cordis.europa.eu/project/id/745667>.

³⁰⁰ BE-Rural, Power4Bio, BIOEASTsUP, SIMRA.

³⁰¹ HORIZON-CL6-2023-CIRCBIO-02-1-two-stage: Circular Cities and Regions Initiative (CCRI)'s circular systemic solutions; HORIZON-CL6-2024-CIRCBIO-01-8: Bioeconomy Project Development

projects on bioeconomy governance and ensure inclusiveness and engagement of all actors. It is also relevant to cooperate and establish links with the Circular Bio-based Europe (CBE) JU, and relevant EIT KICs.

- Seek synergies and complement the knowledge and cooperation activities of the Startup Village Forum. Cooperate with “Rural networks” (soon to become the CAP networks) including the European innovation partnership on agriculture productivity and sustainability (EIP-AGRI) and the European Network for Rural Development (ENRD), and Horizon Europe Partnership Sustainable Food Systems.
- Proposals should explore all available financing instruments on a European level, including relevant regional instruments (Cohesion Fund, CAP, ESF and others). Proposals should also describe how they plan to complement the ongoing activities of bodies such as the European Innovation Council, the Circular Bioeconomy Investment Platform, and the Enterprise Europe Network and European Institute of Technology (EIT) initiatives.
- Social innovation is relevant for this topic as it contributes to strengthened rural innovation ecosystems and to find solutions for rural communities when the solution is at the socio-technical interface and requires social and behavioural change, new social practices, social ownership or market uptake. Proposal should contribute to improve the quality of life and long-term socio-economic prospects of rural and coastal communities, including women (especially supporting women-led SMEs and start-ups), youth and the most vulnerable groups like indigenous people or minorities and refugees.
- This topic requires the effective contribution of SSH disciplines.

Innovating for blue bioeconomy and biotechnology value chains

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CircBio-01-10: Targeting aquatic extremophiles for sourcing novel enzymes, drugs, metabolites and chemicals

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.

Assistance, HORIZON-CL6-2023-GOVERNANCE-01-5: Revitalisation of European local (rural / peri-urban) communities with innovative bio-based business models and social innovation, HORIZON-CL6-2021-COMMUNITIES-01-02- Expertise and training centre on rural innovation.

<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: Selected proposals are expected to contribute to all of the following expected outcomes:

- Contribution to expanding the sustainable exploration of biodiversity hotspot regions, e.g., transitional waters, deep-sea, polar regions;
- Advances in the development of the next generation of sampling methods, technologies, as well as understanding of the legal frameworks within which the development process operates;
- Better preparedness to harvest aquatic bioactive substances in the most environmental friendly manner and support to green industrial bioprocessing with more sustainable bio-based products through bio discovery of novel sources and new biotechnology processes and applications;
- Expansion of bioprospecting from the screening for new chemicals into biological function;
- Advancement in understanding the ecology of marine or other aquatic ecosystems, including possibly the ones on water surface, in sediments, in the internal cavity of sponges etc.;
- Increased commitment to conserve and sustainably use the ocean’s genetic diversity and contribution to the understanding of potential trade-offs inherent in the exploitation of ocean, and other aquatic, biodiversity.

Scope: Extreme environments with huge bio-resources still present enormous challenges for exploration and sampling operations. Challenges are often due to the depth, pH, salinity, temperature and pressure conditions, which make exploration technically difficult, risky and expensive.

Proposals under this topic should explore marine or other aquatic ecosystems with complex and extreme conditions such as temperature, pressure, alkalinity or acidity/pH level, extremely low nutrients, etc. with focus on extremophilic organisms capable of thriving/surviving in such extreme environments (e.g., deep hydrothermal vents, hypersaline lagoons, sub-seafloor sediments). They should develop or optimise tailor-made sampling methods, explore the metabolic, physiological and other adaptation mechanisms to such extreme ecological conditions and look for novel and highly efficient metabolites, drugs, enzymes and chemicals for industrial application.

They should disseminate their results in the most efficient and transparent manner considering the risks and ethics related to science & technology in compliance with EU regulations on

access to genetic resources and the fair and equitable sharing of benefits arising from their utilisation (ABS) in the EU.

Selected projects should collaborate with each other.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Call - Circular economy and bioeconomy sectors

HORIZON-CL6-2024-CIRCBIO-02

Conditions for the Call

Indicative budget(s)³⁰²

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁰³	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023				
Deadline(s): 22 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-CircBio-02-1-two-stage	RIA	15.00	Around 5.00	3
HORIZON-CL6-2024-CircBio-02-2-two-stage	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-CircBio-02-3-two-stage	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-CircBio-02-4-two-stage	IA	15.00	Around 5.00	3
HORIZON-CL6-2024-CircBio-02-5-two-stage	RIA	8.00	Around 4.00	2
HORIZON-CL6-2024-CircBio-02-6-two-stage	IA	15.00	Around 5.00	3
Overall indicative budget		73.00		

³⁰² The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁰³ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Enabling a circular economy transition

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CircBio-02-1-two-stage: Circular solutions for textile value chains through innovative sorting, recycling, and design for recycling

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).

<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5-6 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) enhance European industrial sustainability, competitiveness and resource independence, and ii) improve on consumer and citizen benefits.

Project results are expected to contribute to at least two of the following outcomes:

- Roll-out of systemic solutions for textile sorting, using innovative digital technologies (such as AI, robotics, IoT and blockchain);
- Roll-out of feasible solutions for facilitated disintegration to be incorporated in product design, as an enabler for recycling;
- Increased uptake of mechanical recycling solutions that deliver competitive, high-quality secondary materials;
- Roll-out of thermo-mechanical, chemical and other (e.g., enzymatic) recycling solutions that are sustainable from a zero-pollution, circular material and energy efficiency perspective.

Scope: The topic aims at improved management of the end-of-life phase of textile products. Proposals should address one or more of the following subjects and aim to combine them where relevant in a systemic way: facilitation of the disintegration of textile products through design, sorting, and recycling of textiles.

Textiles are the fourth highest-pressure category for the use of primary raw materials and water and fifth for GHG emissions and a major source of microplastic pollution in production and use phases. They are also a key material and product stream in the circular economy action plan. The purpose of this initiative is also to minimise the use of hazardous substances in processing and textile treatments. Proposals shall also demonstrate and deploy innovative solutions for increased quality, non-toxicity and durability of secondary textile materials and their processing and treatments.

Facilitation of the disintegration of textile products:

Beside the fibre composition affecting recyclability, textile products can also consist of various non-textile components or accessories, and can be coated, laminated or printed on. These hard parts, trims, coatings and laminated layers hamper recycling and are a major barrier for practically all textile fibre recycling technologies, especially chemical recycling technologies. The removal of these non-textile components requires disassembly prior to

recycling, adding costs to the overall recycling process. Despite the various research projects on this topic, the implementation and uptake of these techniques is still far from reality. Proposals should address these challenges. New approaches should also be tested, involving technologies such as robotics and AI. Irrespective of the remaining technological and economical challenges, the implementation of disintegration techniques also requires a system, in which products that are fitted with any of these techniques are properly collected, recognised, and sent towards the right facility to apply the appropriate triggering mechanism.

Systemic solutions for sorting:

Over the coming years, the collected volumes of post-consumer textile waste are expected to increase by a further 65,000 to 90,000 tonnes per year due to the increased amounts of textiles placed on the market and the obligation to separately collect textile waste, which Member States have to put in place by 1 January 2025. This will further increase the need for advanced sorting for collecting organisations in order to create economic value out of this. At the moment, sorting is still mainly a manual process, having a significant contribution to the total process costs of recycled textile fibres. The cost of manual sorting is a major barrier to cost effective production of feedstock for textile fibre recycling. Automated sorting has the potential to deliver sufficient, well-defined and low-cost input to recycling processes, however, to date, this potential is not yet fulfilled. New technologies exist, but their limitations need to be addressed. Due to the limited penetration depth of NIR light, only the surface composition of textiles can be detected. RFID technology requires the textile products to carry an RFID tag and an entire system behind, adapted by all parts of the value chain. Therefore, proposals should develop systemic digital solutions that facilitate traceability and comprehensive exchange of information along the entire value chain, involving the use of technologies such as blockchain, AI and IoT. Proposals should build knowledge and competence regarding information system models, systems for data collection, provide an overview of existing standards and mapping of standardisation needs, include cost calculations and evaluation of Return On Investment (ROI), and consider implications of integrating digital information carriers in textile products.

Further development of textile recycling technologies:

In view of the huge amount of textile waste, which will have to be handled due to the soon mandatory separate collection, possible product requirements such as recycled content and the potential offered by different types of textile recycling, different ways of textile recycling remain relevant and will all be needed in the implementation of the textiles strategy. Mechanical recycling of textiles is an established technology in the market. However, the amount of spinnable fibre and the quality of the fibres should be improved. The integration of robotics, AI, or IoT components will play a role in the improvement of these processes. Thermo-mechanical recycling is a process that is still under development and further research is needed to improve the yield of recycled content and the use of chemicals to increase the quality of the polymer. Chemical and enzymatic recycling are novel technologies. Proposals should upscale polymer recycling of cotton via a pulping process and incorporate customer feedback for optimisation of the process and continuous delivery of suitable textile waste (in

terms of purity and composition) as feedstock. Other options that can be explored are the recycling of polycotton blends and the monomer recycling of PET. The application of these technologies in research and innovation should also be extended to other types of fibres.

Clustering activities with projects under “HORIZON-CL6-2024-CIRCBIO-01-2: Circular solutions for textile value chains based on extended producer responsibility” should be envisaged. A lifecycle perspective using LCA and LCC should be used when validating the technical and economic feasibility of the developed, improved, demonstrated and up-scaled processes. Proposals should also address the issue of side streams such as wastewater and the treatment and reuse. Novel value chain-based solutions through industrial symbiosis should be encouraged. For comparability reasons, LCAs should use well-established methods and be based on PEF wherever feasible. Proposals should fully incorporate the Safe and Sustainable by Design (SSbD) approach. Particular attention should also be given to the implementation of traceability solutions, also with a view to recent policy developments, e.g. the digital product passport. The participation of SMEs and industry is encouraged.

The targeted TRL at the end of the projects is 5 to 6.

HORIZON-CL6-2024-CircBio-02-2-two-stage: Increasing the circularity in plastics value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) enhance European industrial sustainability, competitiveness and resource independence, and ii) improve on consumer and citizen benefits.

Proposal results are expected to contribute to all of the following outcomes:

- Increased deployment and demonstrated benefits of advanced digital solutions (e.g., through AI, robotics, IoT and blockchain) in circular businesses including waste management and recycling;
- Emergence of new value chains using upcycled and/or recycled resources, e.g. through industrial symbiosis;
- Increased upcycling and recycling rates for the targeted material streams;
- Increased uptake of recycled material and upcycling to new higher-value products;
- Increased resource efficiency along and across value chains, causing a measurable reduction in GHG emissions and other environmental pollution and an increase of carbon removals;
- Increased diffusion of new circular business practices, in particular in the uptake of repair, reuse and remanufacturing, but also practices that form part of the sharing economy.

Scope: The new circular economy action plan (CEAP) highlights plastics as one of the four particularly important material and product streams with regard to their circularity potential and their environmental footprint. The circularity deficits for these streams are mainly due to the: lack of trust in secondary raw materials; lack of control over supply chains; lacking focus on material efficiency and design for circularity; unsustainable product lifetimes; lack of repair services; price gap between primary and secondary material; lack of secondary material markets; insufficient collection and sorting systems; insufficient and unpredictable input quality for recycling; insufficient information about quality and quantity of materials, including knowledge about possible microplastics pollution and substances of concern, lack of communication along the lifecycle between manufacturers and recyclers; lack of involvement and empowerment of citizens that would allow environmentally informed purchases.

Proposals should address the priorities set in the CEAP. Beside the continuous implementation of the EU plastics strategy, the CEAP has a strong focus on microplastics, but also calls for mandatory recycled content and the controlled use of bio-based, biodegradable plastics and alternative materials.

Proposals should demonstrate and deploy at large scale innovative solutions and designs for increased quality, non-toxicity and durability of secondary materials and increased share of secondary materials in new products. Proposals should demonstrate increased recovery, recycling and upcycling rates and a higher uptake of secondary materials for high value

applications. Special attention should be given to the increased circularity of critical raw materials¹⁸⁶. Proposals should also demonstrate circular business practices, in particular in the uptake of repair and reuse, remanufacture, product-service-systems, and in the full lifetime of products or services. To achieve this, targeted market size, economic feasibility, cost efficiency and social acceptance need to be addressed. To break down the barriers for this transition, it is important that proposals involve and address the different perspectives of all relevant actors, e.g., manufacturers, retailers, consumers and civil society organisations (CSOs). The projects should consider the use of digital solutions (including technologies such as AI, robotics, IoT and blockchain) and demonstrate their benefits for increased circularity. Proposals should aim to implement traceability solutions in support of recent policy developments, e.g. regarding the digital product passport. Projects should also help produce harmonised and robust methods to assess the amount of recycled content in sectoral products, which is key for a future review of green claims through authorities and consumer organisations. Environmental, social and economic impacts should be assessed from a lifecycle perspective as product, organisation and consumption environmental footprints, using the respective methods developed by the European Commission (Product Environmental Footprint, PEF, should be used for the assessment of the environmental impacts) and through costing methods; relevant data should be fed into the European Platform on Life Cycle Assessment, following the specific Environmental Footprint data and format requirements. The functional performance of technologies and secondary materials can be assessed through the EU Environmental Technology Verification (ETV) scheme. All project results should be validated using quantitative indicators and targets wherever possible.

Projects should also develop training material to endow workers in this occupational group with the right skillset in order to deploy the new technologies developed. Proposals should consider the development of learning resources for the current and future generations of employees, with the possibility to integrate them in existing curricula and modules for undergraduate level and lifelong learning programmes. The projects should provide contributions to relevant standards or best practices.

Proposals should build on ongoing projects funded under Horizon 2020 and Horizon Europe and envisage clustering activities with these. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

The targeted TRL at the end of the projects is 6 to 8.

HORIZON-CL6-2024-CircBio-02-3-two-stage: Increasing the circularity in electronics value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a

	proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: A successful proposal will contribute to the following Destination impacts: i) enhance European industrial sustainability, competitiveness and resource independence, and ii) improve on consumer and citizen benefits.

Proposal results are expected to contribute to all of the following outcomes:

- Increased deployment and demonstrated benefits of advanced digital solutions (e.g., through AI, robotics, IoT and blockchain) in circular businesses including waste management and recycling;
- Emergence of new value chains using upcycled and/or recycled resources;
- Increased upcycling and recycling rates for the targeted material streams;
- Increased uptake of recycled material and upcycling to new higher-value products;
- Increased resource efficiency along and across value chains, causing a measurable reduction in GHG emissions and other environmental pollution and an increase of carbon removals;
- Increased diffusion of new circular business practices, in particular in the uptake of repair, reuse and remanufacturing, but also practices that form part of the sharing economy.

Scope: The circular economy action plan (CEAP) highlights electronics including information and communications technology (ICT) equipment as one of the four particularly important material and product streams with regard to their circularity potential and their environmental

footprint. The circularity deficits for these streams are mainly due to the: lack of trust in secondary raw materials; lack of control over supply chains; lacking focus on material efficiency and design for circularity; unsustainable product lifetimes; lack of repair services; price gap between primary and secondary material; lack of secondary material markets; insufficient collection and sorting systems; insufficient and unpredictable input quality for recycling; insufficient information about quality and quantity of materials, including knowledge about possible microplastics pollution and substances of concern, lack of communication along the lifecycle between manufacturers and recyclers; lack of involvement and empowerment of citizens that would allow environmentally informed purchases.

Proposals should address the priorities set in the CEAP, which states that “electrical and electronic equipment continues to be one of the fastest growing waste streams in the EU, with current annual growth rates of 2%. It is estimated that less than 40% of electronic waste is recycled in the EU. Value is lost when fully or partially functional products are discarded because they are not repairable.”

Proposals should demonstrate and deploy at large scale innovative solutions and designs for increased quality, non-toxicity and durability of secondary materials and increased share of secondary materials in new products. Proposals should demonstrate increased recovery, recycling and upcycling rates and a higher uptake of secondary materials for high value applications. Special attention should be given to the increased circularity of critical raw materials¹⁸⁶. Proposals should also demonstrate circular business practices, in particular in the uptake of repair and reuse, remanufacture, product-service-systems, and in the full lifetime of products or services. To achieve this, targeted market size, economic feasibility, cost efficiency and social acceptance need to be addressed. To break down the barriers for this transition, it is important that proposals involve and address the different perspectives of all relevant actors, e.g., manufacturers, retailers, consumers and civil society organisations (CSOs). The projects should consider the use of digital solutions (including technologies such as AI, robotics, IoT and blockchain) and demonstrate their benefits for increased circularity, also analysing and addressing possible trade-offs. Proposals should aim to implement traceability solutions in support of recent policy developments, e.g. regarding the digital product passport. Projects should also help produce harmonised and robust methods to assess the amount of recycled content in sectoral products, which is key for a future review of green claims through authorities and consumer organisations. Environmental, social and economic impacts should be assessed from a lifecycle perspective as product, organisation and consumption environmental footprints, using the respective methods developed by the European Commission (Product Environmental Footprint, PEF, should be used for the assessment of the environmental impacts) and through costing methods; relevant data should be fed into the European Platform on Life Cycle Assessment, following the specific Environmental Footprint data and format requirements. The functional performance of technologies and secondary materials can be assessed through the EU Environmental Technology Verification (ETV) scheme. All project results should be validated using quantitative indicators and targets wherever possible.

Projects should also develop training material to endow workers in this occupational group with the right skillset in order to deploy the new technologies developed. Proposals should consider the development of learning resources for the current and future generations of employees, with the possibility to integrate them in existing curricula and modules for undergraduate level and lifelong learning programmes. The projects should provide contributions to relevant standards or best practices.

Proposals should build on ongoing projects funded under Horizon 2020 and Horizon Europe and envisage clustering activities with these. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

The targeted TRL at the end of the projects is 6 to 8.

HORIZON-CL6-2024-CircBio-02-4-two-stage: New circular solutions and decentralised approaches for water and wastewater management

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: In support of the European Green Deal and EU water-related policies, successful proposals will contribute achieving sustainable and circular management and use of water resources, as well as prevention and removal of pollution, in particular Destination ‘Circular economy and bioeconomy sectors’ impact ‘Accelerate transitions towards a

sustainable, regenerative, inclusive, just and clean circular economy based on enhanced knowledge and understanding of science’.

Projects results are expected to contribute to all of the following expected outcomes:

- Demonstrate the benefits of decentralised approaches for water and wastewater treatment in various geographic, climate and economic conditions and create a decision framework to help policy makers to see where a decentralised approach can bring the most overall benefits with regards to the centralised one, as well as, how to better design their integration.
- Improve co-design and co-creation processes and synergies between all relevant stakeholders and enhance public engagement to speed up the market uptake of decentralised and/or semi-decentralised solutions.
- An enhanced systemic circular economy approach along the water, cycle by using process integration, to minimise water pollution, water consumption and the environmental footprint (including energy use) of water activities and ensure water security.
- Support the implementation of relevant EU policy needs (e.g., water and marine related policies, water reuse regulation, climate change adaptation strategy, circular economy action plan, the EU zero pollution action plan, and chemical strategy for sustainability).

Scope: With a rapidly changing urban, peri-urban and rural environments, increasing flooding and contamination of water resources, and in order to reap the benefits of circular economy approaches, adapt to climate change and support the implementation of water supply and sanitation related SDG, innovative approaches and technologies are required. Such innovative approaches should go beyond the central objective of protecting human health and environment, by enabling the overall concept of circularity and sustainability in terms of economic feasibility, social equity and acceptance, technical and institutional applicability, environmental protection, and resource recovery.

Moreover, the current COVID19 pandemic highlighted the essential role of safely managed water supply, sanitation, and hygiene services for preventing disease and protecting human health during infectious disease outbreaks and constitutes a good opportunity to revisit strategies implemented so far, and to build a more sustainable society meeting basic needs such as water and sanitation for all.

Decentralised water and wastewater systems can play an important role in delivering such an innovative approach and has the potential for a sustainability transition of the water supply and sanitation sector, by treating wastewater close to its source. However, full and appropriate exploitation of these systems, requires further developments, in order to become economically affordable, ecologically sustainable and socially accepted. In addition, the integration between centralised and local, decentralised and/or semi-decentralised solutions should be further explored.

Actions in this topic should further develop efficient and sustainable decentralised and distributed approaches and technologies for climate-neutral and zero pollution water supply and wastewater treatment to optimise circular and sustainable use of natural resources, including integrated stormwater management systems to encourage water management on site rather than to the sewer. The impact of reduced sewer flows, more concentrated sewage and waste sludge discharges from decentralised systems on sewer infrastructure should be better assessed. A thorough comparison of the overall environmental and economic performance of ongoing decentralized water and wastewater systems in different geographical and climate conditions and their potential for climate mitigation and adaptation should be undertaken, in order to assess under which conditions decentralised systems perform better than the centralised ones and help to create the right enabling environment to overcome various regulatory and technological barriers related to the implementation of these approaches. New urban sanitation models based on decentralised and integrated approaches which consider municipal organic waste and wastewater as source for recovery and recycling materials such as organic matter and nutrients that are included in the organic fraction of municipal solid waste and wastewater streams, could be also considered.

The integration of decentralised and centralised systems for water supply and sanitation is particularly needed in highly urbanised areas where centralised systems are currently used, to provide better water services, by reconciling, for instance, the need to meet an increasing water demand and new quality standards in an economic and sustainable manner, including energy efficiency and production. In this context, this action should:

- Develop an overarching risk analysis and optimization framework for the integrated design and operation of multiple source water supply systems, enhancing the application of digital technologies and solutions.
- Demonstrate the potential of the integration of decentralised with centralised systems for water supply and sanitation in different areas and scales (eg. district level, cities, river basin), to assess the potential benefits/drawbacks, strengthening public participation and engagement and public private partnerships.
- Address potential regulatory, financial and socioeconomic bottlenecks with a view of promoting long-term performance-based business models in public private partnerships for decentralised and/or integrated decentralised and centralised systems.

This action should bring together relevant researchers, technology providers, water utilities, business representatives, investors, policy makers and other water users and citizens. The active participation and engagement of different stakeholders should span the entire project development and implementation to ensure performance and sustainability and maximise the final impact.

To reinforce the potential benefits of implementing these decentralised approaches to policy makers their social impact, notably in terms of employment generation and population settlement in decentralised territories should be demonstrated.

The inclusion of relevant SSH expertise would be also needed to ensure the proposed solutions are also socially accepted.

Decentralised approaches for water and wastewater systems provides significant opportunities for developing countries and emerging economies to establish new alternatives and more sustainable approaches to water supply and sanitation and support the implementation of related SDGs. International cooperation is therefore strongly encouraged.

Innovating for sustainable bio-based systems, biotechnology and the bioeconomy

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CircBio-02-5-two-stage: Circular design of bio-based processes and products

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Successful proposals will enable the bio-based industries in the Union, including SMEs, to contribute to the enhancement of European industrial sustainability, competitiveness and resource independence and to the deployment of innovative and sustainable value-chains in the bio-based sectors as a prerequisite and driver of future solutions for a circular economy and the bioeconomy transitions. Projects results will contribute to deliver bio-based solutions with reduced environmental impacts on soil, water,

and air quality, biodiversity and climate, in line with the EGD objectives, the EU circular economy and the EU zero pollution action plans, the bioeconomy strategy and the communication on sustainable carbon cycles.

Projects results are expected to contribute to all of the following expected outcomes:

- Circular design of bio-based processes and products: increasing resources and energy efficiency of bio-based technologies, decreasing their environmental impacts on soil, water, and air quality, biodiversity and climate, improving durability and suitability of bio-based products to be safely re-used and re-manufactured, allowing for high-quality recycling, increasing the safe recycled content in new products;
- Product information systems enabling the circularity, safety and environmental sustainability of the bio-based manufacturing sectors and of the use of products at consumers' level.

Scope: The bio-based processes and products within the scope of this topic do not include food, feed, biofuels, bioenergy and cultural and recreation sectors. The establishment of safe, resilient, competitive and equitable production and consumption systems with reduced environmental impacts on soil, water, and air quality, biodiversity and climate, is part of the objectives of the EU circular economy.

To improve the capacity of the industrial bio-based sectors within the scope of the topic, especially the manufacturing sectors, to contributing to that objective, proposals should:

- Develop optimized design of bio-based processes and bio-based products to improve their circularity, taking into account the opportunity to re-use recycled materials in the local market. This could be achieved through increasing resources and energy efficiency of processes, improving high-quality recycling technologies, increasing the durability of products and their suitability to be safely re-used and re-manufactured, improved products end-of-life options, increasing the safe recycled content in new products, etc.;
- Assess the safety, environmental sustainability and climate neutrality of circular bio-based processes and products along their value chains, including of the biological feedstock from land and sea used in the production processes. The environmental impacts of processes and products on soil, water, and air quality, biodiversity and climate should be based on existing and validated assessment methods, also developed and improved in past and ongoing R&I projects³⁰⁴. In particular, the climate neutrality should be assessed based both on the reduction of greenhouse gas emissions and on the increase of carbon removals and should include an assessment of the energy efficiency improvement;

³⁰⁴ See, e.g. the project STAR-ProBIO “Sustainability Transition Assessment and Research of Bio-based Products” (H2020 Call 2016 BB-01-2016 Sustainability schemes for the bio-based economy) and the projects developed under the topics HORIZON-CL6-2021-ZEROPOLLUTION-01-05: Environmental sustainability criteria for biological resources production and trade in bio-based systems: impacts and trade-offs and HORIZON-CL6-2023-ZEROPOLLUTION-01-4: Environmental sustainability and circularity criteria for industrial bio-based systems.

- Include the assessment of economic and social aspects of the improved production and consumption bio-based systems in terms of increased economic value along the whole value chains, circular patterns of products involving consumers, i.e., durability, reuse, repair, remanufacturing and recycling patterns, improved economic value of recycled materials, job opportunities, etc.;
- Develop product information systems demonstrating the safe and sustainable use of biological resources and the resource efficiency along value chains, from the production to the extended circular product lifetimes and appropriate disposal. Transparent information should aim at improving the societal acceptance of bio-based innovation and at supporting consumers and customers in making responsible and informed choices.

In order to achieve the expected outcomes, and in line with the EU strategy for international cooperation in research and innovation, international cooperation is encouraged. Projects are expected to contribute to the New European Bauhaus (NEB) initiative by interacting with the NEB Community, NEB Lab and other relevant actions of the NEB initiative through sharing information, best practice, and, where relevant, results.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects, including under the Circular Bio-based Europe JU, the Processes 4 Planet partnership and other European partnerships of Horizon Europe.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-CircBio-02-6-two-stage: From silos to diversity – small-scale bio-based demonstration pilots

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot

	(see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: This topic supports the bioeconomy strategy and the common agriculture policy (CAP) by promoting new business models for the green transition in line with the European Green Deal objectives.

Project results are expected to contribute to all of the following outcomes:

- Demonstration of replicable and scalable, innovative bioeconomy-oriented production and business models with an active involvement of primary producers.
- Enhanced knowledge and awareness on feedstock availability and technology options to better valorise underutilised biomass, residues and waste streams from agriculture and forestry.
- Improved innovation capacities and product portfolio extension in primary production sectors and SMEs.
- Development of new materials, products, and services with considerably lower environmental impacts and at higher value.
- Climate-neutral land sector by 2035 and climate-neutral economy by 2050.

- Diversification and enhancement of agricultural incomes (organic and conventional farming).
- Creation of a stakeholder platform to share best-practice examples and promote new business models in the primary production sectors.
- Promotion of bioeconomy-related interventions in the new CAP and advice and technical guidance for Member States.

Scope: The current economy system is based on an intensive consumption of fossil fuels in a way that severely compromise the future of the planet due to the severe consequences in climate change. Europe's future economic growth and jobs will increasingly have to come from innovation in sustainable products based on renewable resources and in line with the climate and biodiversity objectives. This topic addresses innovative business models and technology options in primary production sectors to unlock the potential of the bioeconomy in rural areas and to efficiently use underutilised biomass, in particular side streams from agriculture and forestry, for high value applications in small-scale bio-based demonstration pilots.

Proposals will:

- Develop new business models for the economic-viable valorisation of local underutilised feedstock, such as by-products, residues, and waste, from land and livestock.
- Demonstrate suitable processes and technologies to produce high-value bio-based materials and products in rural conditions with an active role of primary producers (farmers and foresters) in the value chains.
- Build-upon existing food, feed, or bioenergy value chains to further strengthen their economic and environmental sustainability through synergistic interlinkages and in line with the cascading principle.
- Improve the knowledge on the quantitative and qualitative requirements, harvesting, logistics, pre-treatment (e.g. mechanical, thermal) and conversion of the feedstock.
- Ensure that the bio-based materials and products are based on the latest safety standards.
- Evaluate the environmental and socio-economic performance of the demonstrated value chains.
- Demonstrate the economic feasibility of seeking access to sufficient quantities of raw materials needed to set-up new supply chains and provide evidence that the feedstock streams in question are produced on land that is unsuitable for food production or represent underutilized residues from the agro-food industry.
- Closely interact with other selected projects under this topic and create a joint stakeholder platform to promote best-practice examples for primary producers and SMEs at national and EU-level.

A close cooperation with selected projects from topic HORIZON-CL6-2021-CIRCBIO-01-08 is strongly advised.

Proposals shall apply the concept of the 'multi-actor approach' and ensure adequate involvement of primary producers and other actors active in rural areas.

Proposals may involve financial support to third parties e.g. to primary producers, academic researchers, start-ups, SMEs, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. Consortia need to define the selection process of organisations, for which financial support may be granted. Maximum 20% of the EU funding can be allocated to this purpose.

Proposals are encouraged to include regions where pilot plants and demonstrational sites are missing or underrepresented.

Destination - Clean environment and zero pollution

Anthropogenic pollution undermines the integrity of Earth's ecosystems and severely affects natural resources essential for human life. Keeping our planet clean and our ecosystems healthy will not only help addressing the climate crisis but also help regenerate biodiversity, ensure the sustainability of primary production activities and safeguard the well-being of humankind. In line with the objectives of the European Green Deal and related initiatives targeting environmental challenges, particularly the EU zero pollution action plan, the 2030 climate target plan, and other relevant EU legislation, this destination seeks to halt and prevent pollution by focusing on:

- removing pollution from fresh and marine waters, soils, air, including from nitrogen and phosphorus emissions;
- substituting harmful chemicals;
- improving the environmental sustainability and circularity of bio-based systems;
- reducing environmental impacts of and pollution in food systems.

Synergies with other clusters (notably 1 for health issues and 5 for air pollution from urban sources), relevant destinations, missions (particularly 'A Soil Deal for Europe' and 'Restore our Ocean and Waters by 2030') and partnerships will be exploited.

Topics under the heading *Halting pollution of air, soil and water* aim to identify and demonstrate approaches to combat diffuse emissions of pollutants from land and other sources. In this context, keeping nitrogen (N) and phosphorus (P) cycles in balance is a major challenge. N and P flows from anthropogenic sources, mostly from excessive or inefficient input of fertilisers (manure, sewage sludge, etc.) in agriculture and from waste water treatments, currently exceed planetary boundaries. Their leaching and run-off negatively affect soil biodiversity, pH, organic matter concentration and carbon sequestration capacity, and cause the eutrophication of water bodies while ammonia and nitrous oxide emissions affect air quality and climate. As all environmental compartments are concerned, a systemic approach is needed to limit N/P emissions from different sources, and to bring N/P flows back within safe ecological boundaries, e.g. by improving the way fertilising products in agriculture are managed while taking into account regional conditions. Actions will include showcasing best practices to recover nutrients from secondary raw materials in order to produce alternative fertilisers and demonstrating pathways for regions to keep their N/P flows within ecological boundaries.

Topics under *Protecting drinking water and managing urban water pollution* seek to develop and demonstrate a comprehensive framework bringing together new innovative solutions and approaches to ensure drinking water is of a good quality, address urban water pollution and harmonise different policies and management approaches. Actions should explore solutions to increase the resilience of urban waste water systems, reducing the carbon

footprint and emissions, improve resource efficiency and energy recovery, and limit risks from contaminants of emerging concern. An integrated strategy to harmonise and update monitoring with prioritisation for comprehensive control of urban water cycles should be developed by harnessing the potential of digital solutions.

Topics under *Addressing pollution in seas and ocean* strive to fill knowledge gaps about risks and impacts of pollution from contaminants of emerging concern in the marine environment (in particular pharmaceuticals and endocrine disruptors) including in the context of the changing marine environment due to changes in the climate system. They will further develop and test solutions for the integrated assessment and monitoring of the circulation and impacts of contaminants of emerging concern in the marine environment, in order to help implement EU policies and legislation, e.g. the Water Framework Directive and Marine Strategy Framework Directive. Actions should also explore the role of pollution in intensifying impacts related to climate change, including in the Arctic, resulting in solutions and strategies to help ecosystems and human communities adapt as regards the changes in the Arctic.

Topics under *Increasing the environmental sustainability and circularity of bio-based processes and products* look at developing bio-based solutions for environmental monitoring and remediation as well as the concept of integrating sustainability and circularity into bio-based systems. This concept also includes bio-based chemicals, additives and materials solutions contributing to carbon removal objectives, the chemicals strategy for sustainability (CSS strategy) and the development of safe- and -sustainable-by-design materials and products.

Furthermore, topics under the heading *Reducing the environmental impact and pollution of food systems* focus on increasing our knowledge of the soil, water and air pollution stemming from different food production and supply practices and providing opportunities to reduce environmental and climate impacts of food systems. This also includes preventing and reducing plastic pollution stemming from plastic food packaging.

Expected impact

Proposals for topics under this destination should set out a credible pathway that helps to halt and eliminate pollution to guarantee clean and healthy soils, air, fresh and marine water for all and ensure that natural resources are used and managed in a sustainable and circular manner. To reach this objective, it will be vital to advance the knowledge of pollution sources and pathways to enable preventive measures to be rolled out, improve sustainability and circularity, apply planetary boundaries in practice and introduce effective remediation methods. To this end, the following is required:

- move towards achieving clean, unpolluted surface water and groundwater bodies in the EU and Associated Countries by increasing understanding of diffuse and point sources of **water pollution in a global and climate change context**, enabling novel solutions to avoid degradation and restore water bodies, aquatic ecosystems and soil functionality, and further improve the quality and management of water for safe human and ecological

use, while strengthening the EU's and Associated Countries' positions and roles in the global water scene;

- **balance N/P flows within safe ecological boundaries** at regional and local level, helping restore ecosystems;
- move towards achieving **clean, unpolluted oceans and seas**, including in the Arctic, by means of successful scientific, technological, behavioural, socio-economic, governance and green-blue transitions;
- **strengthen circular bio-based systems** to operate within planetary boundaries, replacing fossil-based systems and their carbon footprint, mitigating climate change, and restoring biodiversity and protecting air, water and soil quality along the supply chain of biological feedstocks and industrial value chains within the EU and Associated Countries and across borders;
- **substitute harmful chemicals** for safer and more sustainable alternatives, notably by boosting innovative biotechnology and other sustainable technologies to create zero-pollution bio-based solutions;
- **reduce the environmental impact of food systems**, e.g. by increasing knowledge of the environmental and climate impacts stemming from the food systems and reducing pollution from plastic food packaging.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023-ZEROPOLLUTION-01	64.50		28 Mar 2023
HORIZON-CL6-2023-ZEROPOLLUTION-02	15.00		28 Mar 2023 (First Stage) 26 Sep 2023 (Second Stage)
HORIZON-CL6-2024-ZEROPOLLUTION-01		38.00	22 Feb 2024
HORIZON-CL6-2024-ZEROPOLLUTION-02		23.00	21 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)
Overall indicative budget	79.50	61.00	

Call - Clean environment and zero pollution

HORIZON-CL6-2023-ZEROPOLLUTION-01

Conditions for the Call

Indicative budget(s)³⁰⁵

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁰⁶	Indicative number of projects expected to be funded
		2023		
Opening: 22 Dec 2022 Deadline(s): 28 Mar 2023				
HORIZON-CL6-2023-ZEROPOLLUTION-01-1	RIA	6.00	Around 6.00	1
HORIZON-CL6-2023-ZEROPOLLUTION-01-2	RIA	12.50	Around 6.25	2
HORIZON-CL6-2023-ZEROPOLLUTION-01-3	RIA	12.00	Around 6.00	2
HORIZON-CL6-2023-ZEROPOLLUTION-01-4	RIA	8.00	Around 4.00	2
HORIZON-CL6-2023-ZEROPOLLUTION-01-5	IA	10.00	Around 5.00	2
HORIZON-CL6-2023-ZEROPOLLUTION-01-6	RIA	8.00	Around 4.00	2
HORIZON-CL6-2023-ZEROPOLLUTION-01-7	RIA	8.00	Around 4.00	2

³⁰⁵ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁰⁶ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

Overall indicative budget		64.50		
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General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Halting pollution of air, soil and water

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION-01-1: Knowledge and innovative solutions in agriculture for water availability and quality

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of

	Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal’s farm to fork strategy and the zero pollution ambition, the Water Framework Directive, and the data provided by the European Environmental Agency (EEA), successful proposals will contribute to enhancing sustainable water management, based on increased resilience of agriculture to drought and floods, while maintaining the good functioning of the water ecosystem to ensure good status of water bodies.

Projects results are expected to contribute to all of the following expected outcomes:

- The quality and safety of irrigation water, as well as the prevention of contamination of natural habitats, including minimizing groundwater pollution and securing groundwater resources, and minimizing eutrophication of surface waters, are ensured.
- Enhanced understanding of current water, fertilizer and pesticide requirements in the agricultural sector for different systems and regions, in order to prevent surface water and groundwater contamination with pesticides, nutrients from fertilizers and other contaminants.
- Protection of surface water and groundwater quality against harmful impacts of climate change.
- Advanced understanding and prediction of the impacts to water availability and quality of climate change affecting agricultural water consumption patterns, to protect surface water and groundwater quality against harmful impacts of climate change.
- Solutions, pathways and strategies for risk assessment, mitigation and adaptation to agricultural (irrigation) practices in the event of extreme weather pressures (flooding, drought), which consider technical (such as land features/soil types) and socio-economic parameters.

Scope: Water availability (including permitting, measuring volumes and pricing) and quality is one of the most pressing issues, affecting human health, limiting food production, limiting ecological services, and hindering economic growth.

Extreme climatic events (notably droughts) are leading to increased water stress, affecting the water needs for agriculture and other uses. At the same time, water availability is itself impacted by climate change and this resource is becoming scarce in many places in the EU. The repartition of water to the users is becoming challenging. Agriculture is currently

accounting to around one fourth of the total water extraction in the EU,³⁰⁷ which is leading to tensions and in some cases to conflicts, in particular where illegal abstraction takes place. It is therefore crucial to prepare agriculture to adapt to a new context where water in agriculture is more sustainably and efficiently used, without compromising the water availability for other users or undermining the good status of waterbodies.

Proposals should address the following:

- Produce tools and techniques to support farmers, special planners, policy makers and water managers with scientific and practical knowledge, including advice on appropriated price incentives and water management assistance, optimising agricultural water use, not only water for irrigation but also water used by local people and in other economic sectors, for the benefit of a healthy environment.
- Develop or improve with new scientific knowledge and practice the methodology for monitoring and prediction of water quality and quantity requirements for agricultural use, based on information provided by Earth Observation systems and in situ measurements, using digital technologies such as smart (bio)sensors³⁰⁸ and artificial intelligence (AI), as well as DNA-based indicators, that integrate monitoring and modelling tools to support decisions in relation to water management.
- Assess and propose relevant adaptation of water infrastructures for irrigation, agricultural practices and land use. Consider nature-based solutions and latest technologies to address emerging needs and challenges like floods, droughts and/or salinization. Proposed measures should increase the resilience of agriculture by lowering the need for irrigation, reducing at the same time the environmental impact associated with irrigation in agriculture (e.g. salinisation and concentration of nutrients and pollutants) and therefore enhancing ecosystem protection and biodiversity preservation.
- Develop scientific and practice advice to reduce water losses in agricultural activities while considering farmer's water security and quality challenges.
- Technologies to support a significant reduction of the presence of pesticide residues and nutrients in water bodies to levels that are no longer harmful.

Proposals should earmark the necessary resources for cooperation and networking activities. Activities should build upon and link with the work done under relevant Horizon 2020 and Horizon Europe projects including as part of the Horizon 2020 art. 185 PRIMA partnership. Collaboration with the European partnership Water4all – Water security for the Planet should be explored, as needed.

³⁰⁷ European Environment Agency, “Water and agriculture: towards sustainable solutions”, EEA Report No 17/2020.

³⁰⁸ See for example the parallel topic HORIZON-CL6-2023-ZEROPOLLUTION-01-6: Biosensors and user-friendly diagnostic tools for environmental services.

Addressing pollution in seas and ocean

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION-01-2: Integrated assessment and monitoring of emerging pollutants in the marine environment

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.25 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.50 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: In line with the European Green Deal’s zero pollution ambition, successful proposals will contribute to the protection of marine ecosystems and marine biodiversity from impacts of pollution, in particular from contaminants of emerging concern. They should analyse the impacts and risks of the contaminants of emerging concern on marine ecosystems and marine biodiversity and provide basis for an integrated assessment and monitoring of the pathways of these contaminants in the marine environment. This will contribute in particular to the implementation of EU zero pollution action plan for air, water and soil and of the EU biodiversity strategy for 2030.

Projects results are expected to contribute to all the following outcomes:

- Filled gaps in knowledge about the impacts and risks of contaminants of emerging concern (e.g. pharmaceuticals, endocrine disruptors, biocides, micro and nano plastics) on marine ecosystems, including in marine sediments and on deep-sea ecosystems and on marine biota and on marine biodiversity, and including in relation to climate change mitigation and adaptation;

- Provided advanced understanding of possible interactions between the changing marine environment (e.g. increased temperatures, changes in salinity and pH, etc.) due to changes in the climate system and contaminants of emerging concern in the marine environment, including marine sediments and impacts on marine ecosystems and marine biota and biodiversity;
- Designed and tested solutions for integrated assessment, monitoring, modelling and forecasting of the circulation and impacts of contaminants of emerging concern in marine environment (including marine sediments and taking into account the climate change dimension –both mitigation and adaptation–), ecosystems and on marine biota, including establishing testing methods, effect-based monitoring protocols and ensuring sustained collection and sharing of data under FAIR principles;
- Build on, and widen, the data availability in European Research Infrastructures federated under the European Open Science Cloud³⁰⁹;

Developed tools and guidance to support the implementation of relevant EU policies (e.g., Water Framework Directive, EU Marine Strategy Framework Directive, and EU zero pollution action plan for air, water and soil, the EU biodiversity strategy for 2030).

Scope: Contaminants of emerging concern including pharmaceutical products, endocrine disruptors and contaminants found in personal care products, including micro plastics and nano plastics, are increasingly detected in surface and marine waters, as well as in marine sediments. There are concerns about the impact of these contaminants on the marine environment, ecosystems and biodiversity as some of these substances exhibit impacts on aquatic organisms at very low concentrations, in particular on their reproduction and development. There are also concerns about the accumulation of these contaminants in different parts of the marine environment, including sediments and deep sea marine ecosystems and biota.

Also, changes in the marine environment driven by the changing climate system (such as increases in water temperature, changes in salinity and in pH levels, increase in invasive species, etc.) may further influence the possible impacts of the contaminants of emerging concerns on the marine environment, ecosystems and biota.

The projects are expected to develop and test integrated assessment and effect-based monitoring of impacts of contaminants of emerging concern on marine environment, ecosystems and biodiversity, including testing methods that are aligned with the relevant OECD guidance³¹⁰, and where relevant develop new contaminant thresholds. The projects are expected to adopt an integrated and systemic approach to the assessment of impacts, including not only impacts on marine biota but also the circulation, accumulation, magnification, persistence and degradation of the contaminants of emerging concern in marine environment

³⁰⁹ <https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-en>.

³¹⁰ For instance as regards endocrine disruptors, see [Revised Guidance Document 150 on Standardised Test Guidelines for Evaluating Chemicals for Endocrine Disruption | en | OECD](#).

and ecosystems (including marine sediments and deep-sea ecosystems) and their interaction with the changing marine environment. Projects should contribute to the improvement of understanding of the spatial and temporal distribution patterns of contaminants of emerging concern in marine environment and should close knowledge gaps as regards the characteristics, occurrence and impacts of those contaminants on marine environment and marine biodiversity. The projects should furthermore contribute to the understanding of impacts of contaminants of emerging concern on marine biota and on marine biodiversity and provide basis for the design of effective future measures for the protection of marine biodiversity from the impacts of such contaminants.

The projects should recommend best practices in monitoring of the circulation of these contaminants in the marine environment and for the measurement of their impacts and risks, for their possible future integration into EU pollution monitoring and assessment systems, in particular under the Water Framework Directive, the Marine Strategy Framework Directive, the EU zero pollution action plan and for the implementation of the EU biodiversity strategy for 2030.

The projects funded under this topic will:

- build links with the European Mission ‘Restore our ocean and waters by 2030’, in particular: HORIZON-MISS-OCEAN-2021-03-01: Mediterranean sea basin lighthouse: actions to prevent, minimise and remediate litter and plastic pollution, HORIZON-MISS-OCEAN-2021-03-02: Mediterranean sea basin lighthouse: coordination activities and HORIZON-MISS-OCEAN-2022-01-03: Mediterranean sea basin lighthouse: actions to prevent, minimise and remediate chemical pollution;
- build links Mission implementation monitoring system that will be part of the Mission Implementation Support Platform for reporting, monitoring and coordination of all relevant implementation activities;
- build links and support the Mission ocean and water knowledge and information system (Digital Twin Ocean), in particular by contributing to pollution monitoring, forecasting, modelling and knowledge creation and data and sharing;
- Collaboration of the projects with research infrastructures (ERICs) such as ARGO and EMSO and with accredited laboratories is encouraged.

HORIZON-CL6-2023-ZEROPOLLUTION-01-3: Tackling human and climate change induced pollution in the Arctic - building resilient socio-ecological systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to one project within the area A that is the highest ranked, and one project highest ranked within the area B, provided that the applications attain all thresholds. Proposals shall clearly indicate the area they are applying to.

Expected Outcome: In line with the European Green Deal’s zero pollution ambition, successful proposals should contribute to protecting Arctic ecosystems. They should analyse main pollution sources in a climate change context, and examine ways to prevent or eliminate pollutants, consequently protecting environmental and human health and the quality of aquatic ecosystems. This will contribute to the implementation of the new EU policy for a peaceful, sustainable and prosperous Arctic, to the follow-up of the 3rd Arctic Science ministerial meeting and to the work of the Arctic Council.

Projects results are expected to contribute to all of the following outcomes:

- Advanced scientific understanding of the impacts of pollution in the Arctic, including marine litter, emerging pollutants and plastic pollution, as well as diverse chemical discharges, and its interactions with the changing climate and thawing permafrost;
- Advanced understanding of the main ecological, socio-economic and health associated risks and challenges, following a One Health approach³¹¹;
- Resilience and adaptation strategies identified for both ecosystems and human communities, in relation to the changes in Arctic. Design solutions and pathways for ecological and societal mitigation and adaptation;
- Contribute to making the case for the designation and, if applicable, contribute to the establishment management plans of MPAs in international Arctic waters.

³¹¹ The term “One Health” describes a multidisciplinary approach to health risks in humans, animals, plants, and the environment.

- Assessment and monitoring tools developed for pollution impacts, using participatory approaches, citizen science and involving local and indigenous communities;
- Contribute to the implementation of the EU policy for the Arctic and the follow-up of the 3rd Arctic Science Ministerial meeting.

Scope: Main environmental concerns in the Arctic stem from the loss of pristine environment and unique ecosystems. On one hand, ice melting allows for more people and economic activities to enter the area, and on the other hand, transboundary pollution brings into the Arctic contaminants whose sources are thousands of kilometres away.

Arctic economic development is associated with a high risk of air and marine pollution, particularly from oil spills, local mining, Persistent Organic Pollutants (POP), heavy metals, radioactive substances, marine litter and plastics. Pollution from Arctic shipping and tourism relying on heavy diesel fuels induce greater ice melting pack and have negative effects on marine life. Pollutants from local and distant sources are taken up by organisms and incorporated into polar food webs, jeopardizing human and environmental health.

Another threat to the Arctic environment is the growing prevalence of marine litter, and specifically plastic pollution. High concentrations of microplastic particles have been detected in Arctic ice, with a good deal of it suspected to have originated outside of the region.

Moreover, the share of MPA coverage in Arctic water (see for example the OSPAR Convention area) is particularly low.

Thawing permafrost brings in additional risks for pollution, from releasing pathogens to infrastructure degradation and failure. Combined, these drivers create a mosaic of multiple and mutually reinforcing anthropogenic stressors acting on the unique and highly vulnerable Arctic ecosystem.

Proposals should aim at developing innovative approaches to address only one of the following options:

- Area A: Local and transboundary Pollutants in the Arctic – risks and challenges in a One Health approach

Actions are expected to identify, assess, and analyse major impacts and risks of remote and local sources of pollution on the health, well-being and food security of Arctic societies and ecosystems and beyond, and propose adaptation and resilience strategies.

Actions should improve the understanding of the interactions between the changing climate system, changes in biological diversity and pollutant levels, including climate-driven ecosystem changes that are affecting natural emissions, such as wetlands (CH₄), wildfires (CO₂, black carbon), pollutant deposition or transfer and bioaccumulation in marine systems. They should analyse the cultural, socio-economic and health impacts on residents of the Arctic, their livelihood and food security, as well as adverse effects on the marine and terrestrial biodiversity of the region. They are expected to contribute to a better understanding

of long-distance transport of marine plastic litter in the Arctic and air transport of micro plastics, as well to the dynamics between melting ice and increasing discharges of, for example, mercury in the marine ecosystem, and their impact on ecosystems and food safety.

- Area B: Pollution and health risks linked to permafrost thaw

Rising temperatures induce thawing of permafrost, bringing an extra layer of complexity for assessing pollution and health risks in the Arctic environments. Greenhouse gases released from thawing permafrost threaten to cause irreversible changes in the Arctic and other regions. Thawing permafrost causes change in mechanical properties of soils, which in turn deteriorates stability and service-life of built infrastructure and increases coastal erosion.

Actions should address and analyse the adverse effects and pollution risks linked to permafrost thaw, infrastructure degradation and failure, and other associated risks for the environment and human health and well-being. Actions will focus on an improved quantification of these effects, as well as emerging contaminants and re-emission of legacy contaminants due to melting cryosphere or thawing permafrost.

Actions are expected to improve the understanding of the impacts of permafrost thaw on the health of humans, plants, animals, and wider environment, in a One Health approach, including critical infrastructure, water and food security aspects, and wider socio-economic, demographic and cultural impact.

Proposals should assess the impact, trends and new scenarios on ecosystem services, including exploring ecosystems management techniques with special attention to community or nature-based solutions. Potential measures should focus on developing community-oriented decision support systems, and co-design mitigation and adaptation measures.

For both options, proposals should focus on an improved quantification of these effects and explore pathways to minimise risks and should be linked with state-of-the-art climate change predictions coupled with socio-economic models; assess the ecosystems' responses to risk factors and how these responses are affecting the well-being of indigenous populations and local communities but also health of the environment, in a One Health approach; identify adaptation and mitigation strategies, aiming at building resilient Arctic socio-ecological systems.

Proposals are expected to adopt a system thinking or transdisciplinary approach, with simultaneous analysis of environmental, societal, climatic and biodiversity impacts, their relationships and interlinkages, and positive and negative feedbacks. The participation of technical sciences, social sciences and humanities disciplines is important for addressing the complex challenges of this topic, as well as engaging local communities in the research process, as appropriate.

International cooperation is encouraged, with a strong linkage with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance and encouraging participation from countries that take part in the Arctic Science Ministerial meetings.

Actions under this topic should plan on a close collaboration among each other and with the EU Polar Cluster. Actions should build upon and link with past Horizon 2020 projects (e.g., Nunataryuk and Arctic PASSION), EU Polarnet 2, Copernicus, Sustaining Arctic Observing Networks (SAON).

Synergies and complementarities with HORIZON-CL5-2024-D1-01-02: Inland ice, including snow cover, glaciers, ice sheets and permafrost, and their interaction with climate change; HORIZON-CL6-2023-COMMUNITIES-11: Participation and empowerment of Arctic coastal, local, and indigenous communities in environmental decision-making; HORIZON-CL6-2023-ZEROPOLLUTION-01-2: Integrated assessment and monitoring of emerging pollutants, and activities under the Arctic-Atlantic Lighthouse of the EU Mission Restore our ocean and waters.

Increasing environmental performances and sustainability of bio-based processes and products

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION-01-4: Environmental sustainability and circularity criteria for industrial bio-based systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5 by the end of the project – see General Annex B.

Expected Outcome: Successful proposals will support bio-based industries, traders and researchers and innovators, to assess and trace the environmental impacts and circularity of industrial bio-based systems in order to enable responsible production and to steer innovation in the industrial bio-based systems in the EU. Project outcomes will contribute to enhancing circular bio-based systems to operate according to planetary boundaries, replacing fossil-based systems and their carbon footprint, mitigating climate change, restoring biodiversity and protecting air, water and soil quality along supply chain of biological feedstock and industrial value chains, in line with the 2030 climate target plan, the EU zero pollution action plan and the communication on sustainable carbon cycles.

Projects results are expected to contribute to the following expected outcome:

- Standardisation of methods assessing the environmental impacts on soil, water and air quality, biodiversity and climate, and the circularity along the value chains of bio-based products for international trade at EU and global scale.
- Methods to assess the environmental sustainability and the circularity of low TRL bio-based technologies.
- Orientations for research and innovation programmes in the bio-based sectors.

Scope: The environmental sustainability and circularity assessment of industrial bio-based systems is instrumental to guarantee and monitor that they are developed in a way they can contribute to the just green transition of the EU economy away from a linear fossil-based system. On one hand, the method for such assessment, applied to high TRL bio-based solutions, would represent an instrument for policy makers and for investors, to support the deployment of and to leverage investments in the best performing bio-based sectors. On the other hand, the assessment of the environmental sustainability and circularity of low TRL, cutting-edge bio-based technologies is important to understand the potential of emerging technologies to contribute to the just green transition, also compared to the more mature technologies. Such knowledge would have an impact on the programming of R&I support initiatives, to save resources and move faster towards the scaling-up of the most promising bio-based technologies, including focussing on the potential environmental hotspots of the emerging technologies.

The assessment of the environmental sustainability and circularity should benefit to the greatest extent possible from existing methodologies and indicators, which can be adapted if needed. Methods and indicators should use the available environmental observations efficiently.

To deliver on the expected outcome, proposals should:

- Identify the range of high TRL industrial bio-based systems in the Union to be analysed in the project. Industrial bio-based systems within the scope of this topic do not include food, feed, biofuels, bioenergy and cultural and recreation sectors;
- Improve existing and/or develop new methods to assess environmental impacts of the selected industrial bio-based systems on climate, biodiversity, land use and water resources as priorities, but also on soil, water and air quality. Assessments should consider the life cycle perspective. The impact on climate should include the both the greenhouse gas emissions and the carbon removal potential of bio-based systems. The analysis should include trade-offs, for example between direct and indirect land use and land use change impacts and the carbon storage and substitution effect of bio-based products and provide an overall assessment of the environmental sustainability of the systems within the scope;
- Improve existing and/or develop new metrics of circularity of industrial bio-based systems based on the application of the cascading approach of biomass use, the resources

efficiency, and effectiveness on a life-cycle perspective (i.e. durability, reuse, repair, remanufacturing and recycling patterns of bio-based products), other circular aspects;

- Analyse trade-offs and synergies with economic and social objectives (including geographical distribution aspects, urbanization pressures, etc.) and with competing and adjacent economy sectors in the bioeconomy (e.g. food and feed, biofuels and bioenergy) as well as with the fossil-based industrial systems;
- Collect and analyse the (range of) best available industrial bio-based systems within the Union in terms of environmental and circular performances, to build a set of benchmarks or references with best performances for similar industrial systems;
- Include the environmental sustainability and circularity of bio-based products, as assessed through the methods developed under the project, in existing certification scheme at EU and global scale, to enable international trade of certified sustainable bio-based products;
- Consult stakeholders on the applicability of proposed certification schemes, also to improve the societal readiness adaptation in terms of acceptability and uptake of innovations by society;
- Develop and disseminate guidelines for targeted stakeholders on the assessment methods and the enhanced certification schemes developed in the project;
- Perform a preliminary analysis and improvement of the methods for the assessment of environmental sustainability and circularity performances of bio-based supply and value chains adapted to very low TRL bio-based technologies through: i) a review of the “prospective” LCA approaches and applications to bio-based and fossil-based technologies, with a focus on the environmental sustainability and circularity assessment approaches and tools. This task would lead to improve understanding and classifying the main challenges of prospective LCAs, e.g., comparability of results, input data availability, uncertainties/robustness, etc.; ii) the adaptation of the “prospective” LCA approaches to very low TRL bio-based technologies, including via modelling approach; iii) modelling the tests to validate the developed methods on a range of low TRL technologies and processes, including in relevant environments for future R&I projects; iv) including the analysis of potential synergies and trade-offs with economic and social objectives;
- Develop and disseminate guidelines to targeted stakeholders on the assessment of environmental sustainability and circularity performances of bio-based supply and value chains adapted to very low TRL bio-based technologies.

Consortia of applicants should involve LCA experts and researchers in the bio-based technologies, bio-based industries, trade bodies, consumers’ organisations and any relevant stakeholder along the value chain of industrial bio-based systems.

Where relevant, proposals should seek links with and capitalise on the results of past³¹² and ongoing EU funded projects, including under the Circular Bio-based Europe JU³¹³ and other partnerships of Horizon Europe.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

HORIZON-CL6-2023-ZEROPOLLUTION-01-5: Industrial biotechnology approaches for improved sustainability and output of industrial bio-based processes

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³¹⁴

Expected Outcome: A successful proposal will contribute to all Destination ‘Zero pollution’ and in particular impacts related to enhancing circular bio-based systems to operate according to planetary boundaries, replacing fossil-based systems and their carbon footprint, mitigating climate change, restoring biodiversity and protecting air, water and soil quality along supply

³¹² See for example HORIZON-CL6-2021-ZEROPOLLUTION-01-07: International and EU sustainability certification schemes for bio-based systems.

³¹³ See for example CBE JU2022.S1. Developing and validating monitoring systems of environmental sustainability and circularity: collection of best practices and benchmarks

³¹⁴ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

chain of biological feedstock and industrial value chains within the EU and Associated Countries and across borders. Furthermore, it will contribute by substituting harmful chemicals by safer, less toxic and generally more sustainable alternatives notably by boosting innovative biotechnology and other related technologies to create zero-pollution bio-based solutions.

Industrial biotechnology has a high potential to contribute to increased sustainability and in particular ‘zero pollution’ ambition of the European Green Deal, in respect to the (circular) industrial bio-based processes.

Project results are expected to contribute to all of the following outcomes:

- Improved environmental sustainability, especially in terms of reduced toxicity, and overall safety to live organisms and ecosystems, of industrial bio-based processes, and of chemical and materials outputs, aligned with the EU climate-goals and zero-pollution ambition of the European Green Deal, in particular by lowering the input requirements in terms of e.g., land use, (virgin) feedstocks, water and energy, and by general advancement of non-toxic / zero-pollution production processes with positive impacts on water, air and soil quality.
- Improved industrial competitiveness by developing scalable, flexible and robust multi-product manufacturing, responding to current trends in the industrial biotechnology (e.g., on-demand production, small-volume outputs, lower capital expenditure, digital / artificial intelligence (AI) solutions, lower/minimal dependence on scarce natural resources, especially in terms of biological feedstocks), ensuring links to EU / Associated Countries industrial ecosystems (SMEs, EU Partnerships such as Circular Bio-based Europe JU).
- Enhanced social engagement and understanding of advanced bio-based innovation and in particular biotechnology among broad sectors of society, with active social innovation supported via dialogue with e.g., NGOs, end-user and consumer groups, schools or science centres etc.

Enhanced market up-take linked to improved governance³¹⁵ enabled by dialogue with regulatory actors and supporting networks, and by improved public awareness.

Scope:

- The scope covers a wide array of biotechnology techniques, including targeted and specific approaches for DNA modification, including synthetic engineering at gene or genome level, in line with the binding regulatory requirements, including related necessary technical aspects in other fields, such as synthetic biology, cell sorting, automation, robotics, IT data/digital/AI innovations, or the ‘biofoundry’ concept^{316, 317}.

³¹⁵ See parallel topic HORIZON-CL6-2023-GOVERNANCE-01-6: Co-creation and trust-building measures for biotechnology and bio-based innovation systems.

³¹⁶ <http://www.weforum.org/agenda/2019/10/biofoundries-the-new-factories-for-genetic-products/>.

³¹⁷ <http://www.oecd-ilibrary.org/sites/bd16d851-en/index.html?itemId=/content/component/bd16d851-en>

Approaches based on improved enzymatic solutions should carefully consider a parallel topic³¹⁸, to avoid overlaps, and create synergies.

- Environmental improvements, especially reduced pollution/toxicity and lowered impacts should be verified and demonstrated by established methodology of life cycle assessment, and the monitoring approaches throughout the project need to be clearly established.
- Production of biofuels and bioenergy is excluded from scope, to avoid overlaps with Horizon Europe Cluster 5. Health applications need to be carefully considered to avoid possible overlaps with activities supported under Horizon Europe Cluster 1.
- Clear communication and dissemination activities are an essential element, including awareness raising, engagement of societal actors (NGOs, consumer organisations, professional organisations). Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.
- International cooperation options may be considered, for win-win cooperation, and pursued if contributing to the European industrial competitiveness.
- In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-ZEROPOLLUTION-01-6: Biosensors and user-friendly diagnostic tools for environmental services

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

Expected Outcome: A successful proposal will contribute to all Destination ‘Zero pollution’ and in particular impacts related to enhancing circular bio-based systems to operate according to planetary boundaries, replacing fossil-based systems and their carbon footprint, mitigating

³¹⁸ HORIZON-CL6-2023-CIRCBIO-01-5: Broadening the spectrum of robust enzymes and microbial hosts in industrial biotechnology.

climate change, restoring biodiversity and protecting air, water and soil quality along supply chain of biological feedstock and industrial value chains within the EU and Associated Countries and across borders. Furthermore, it will contribute to substitute harmful chemicals by safer and more sustainable alternatives notably by boosting innovative biotechnology and other sustainable technologies to create zero-pollution bio-based solutions.

Project results are expected to contribute to all of the following outcomes:

- Improving the quality of environment (water, soil and air) by stepping up the reliable monitoring and detection, of any biotic or abiotic pollutants, by developing practical, specific, adaptable and economic tools, based on bio-based principles, for the use of consumers, inspection services and industry operators alike. This can cover the use at industrial locations, but also at ecological disaster- or accidents' sites, or at home applications;
- Contributing to the zero-pollution objective of the European Green Deal and to the European Missions such as one on 'Restoring our ocean and waters by 2030' or 'A Soil Deal for Europe' by up-scaling the application of modern biosensors underpinned by the biotechnology, across a variety of ecosystems, including marine and freshwater or soil ecosystems and real-life conditions impacted by the pollution issues;
- Increasing engagement and competitiveness of the European environmental services sector, such as the SMEs and industry operators, including the digital sector actors, supporting the convergence between bio-based and digital sectors (including the role of artificial intelligence (AI) solutions). Increasing the awareness and understanding of the underpinning technologies by the civil society, including NGOs and consumer organisations, as well as participatory approaches such as citizen engagement, including citizen science, in environmental observation and monitoring.

Scope: The scope covers the development of high-resolution biosensors for environmental monitoring and detection. The focus is on:

- (1) large scale synthesis of biosensor variants, across kingdoms (from bacteria/archaea to plants);
- (2) improved biosensor/genetic circuit designs for a multitude of sensor inputs, integrating modified microorganism (elements) with transduction/detection systems enabling to relay the information to the user, while guaranteeing environmental safety, especially related to any risk of potential release of such microorganisms into open environment, if relevant;
- (3) develop protein-based (RNA) biosensors to detect and measure metabolites and organisms of interest;
- (4) create organisms that can act as multiplexing sensors capable of canalizing multiple environmental cues and providing measurable responses or combination of responses that may be deconvoluted to determine stimuli, while guaranteeing environmental safety,

especially related to any risk of potential release of such organisms into open environment;

- (5) build more extensive and fully-sequenced metagenomics databases/libraries to enable searches for diverse functionalities across multiple gene clusters; and
- (6) better enable real-time data feeds.

The end-users targeted include consumers but also inspection services and the industry operators, as well as environmental emergency responders. Communication and inclusive participation form an essential part of the proposals. All environmental conditions and ecosystems (water, soil, air etc), may be covered.

Concrete efforts shall be made to ensure that the data produced in the context of this project is FAIR (Findable, Accessible, Interoperable and Re-usable), particularly in the context of real-time data feeds, exploring workflows that can provide “FAIR-by-design” data, i.e., data that is FAIR from its generation. Projects shall further build on, and widen, the data availability in European Research Infrastructures federated under the European Open Science Cloud.

To respect the ‘Do-No-Significant-Harm’ (DNSH) principle, proposals using any alive organisms need to properly assess and exclude any potential risk of their release to open environment.

The projects funded under this topic may:

- build links with the European Mission ‘Restore our ocean and waters by 2030’ or Soil Mission, in particular as regards stepping up the monitoring of ecosystems and their biodiversity;
- build links with Missions implementation monitoring system;
- build links and support the Missions knowledge and information system, in particular by contributing to pollution monitoring, modelling and knowledge creation and data.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.

Reducing the environmental impact and pollution in food systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION-01-7: Strategies to prevent and reduce plastic packaging pollution from the food system

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: To support the implementation of the European Green Deal, the new circular economy action plan, the EU 2030 climate target plan, the farm to fork strategy, the food 2030 initiative and the Mission ‘Restore our ocean and waters by 2030’, successful proposals are expected to contribute to all of the following expected outcomes:

- Increased knowledge on the impacts of littered plastic food packaging on the terrestrial, freshwater and marine environments and ecosystems, including the climate change mitigation and adaptation dimensions;
- Uptake of innovative business strategies, design and production models to prevent and reduce the use of plastic food packaging;
- Adoption of increasingly sustainable, effective and efficient fit-for-purpose packaging solutions by food operators, and reduction of the dependency on fossil-based materials, thus contributing to EU climate action;
- Increased reuse and recycling of sustainable packaging;
- Increased consumer acceptance of sustainable, efficient and fit-for-purpose food packaging solutions including where appropriate the non-use of any type of packaging;
- Support to the implementation of the relevant targets as outlined in the revised packaging and packaging waste directive and the directive on single-use plastics and support to operators, especially SMEs, in meeting the requirements of the relevant EU legislation.

Scope: The use of single-use plastics in food packaging has grown significantly in the last decades, leading to increased pollution in the environment and greenhouse gas emissions. While plastic packaging is an enabler for the safety and shelf life of food products, contributing to the reduction of food waste, there is a need for improved solutions that promote the prevention and reduction of excessive packaging in the food industry. Often, the excessive food packaging results in its inappropriate disposal or littering by consumers. This

can be reduced through the application of circular models for design and production and the proper disposal and recycling of packaging waste.

Proposals are expected to:

- Provide a comprehensive and evidenced based analysis of the negative impacts and externalities of littered plastic food packaging in the different terrestrial, freshwater and marine environments and ecosystems across Europe. This analysis should provide reliable quantitative new data and fill in existing data gaps on these negative impacts and externalities through multiple sources, including citizen science tools.
- Provide an analysis of the main challenges and existing good practices of prevention and reduction of single use plastics, aiming at shifting the current packaging design and production practices. This analysis should address the availability of sustainable and innovative alternatives as well as the readiness of food packaging producers and food business operators to adopt such solutions.
- Develop innovative business strategies, design and production models that improve the prevention, reduction and reuse of plastic food packaging, whilst ensuring that they can be easily implemented in European countries. These business strategies and models should involve all relevant actors, including food SMEs and, when appropriate, policy makers. They should consider health and environmental impacts³¹⁹ of packaging, guaranteeing they do not cause any contamination of food and the environment by hazardous chemicals. Moreover, they should maintain the microbiological and chemical safety and quality of food, taking into account relevant parameters such as their contact with aqueous and fatty foods, aging, and effect on shelf life.
- Develop innovative strategies, design and production models to facilitate packaging recycling, linking developers of sustainable packaging with converters and recyclers, taking into account the recycling capacity technologies and the relevant technical specifications of the use of recycled content. These strategies should namely target collection systems, the use of mono-materials, the reduction of labelling materials and the promotion of easy to sort and clean materials.
- Develop strategies aimed at improving consumer acceptance of sustainable, efficient and fit-for-purpose packaging solutions, facilitating the use of reusable and recyclable packaging for consumers, easing the sorting and appropriate disposal of packaging, and helping them to correctly interpret labelling of packaging. These strategies should be designed based on a joint effort of developers of sustainable packaging and consumers and should aim at avoiding confusion, minimising misuse, increasing user convenience and encouraging a greater uptake of such packaging solutions.

³¹⁹ Examples of these impacts include endocrine disruptors or perfluoroalkyl substances in coatings, lack of inertness or organoleptic risks from uncoated paper, and characterising risks such as from epoxy silanes in adhesives, and from mineral oil hydrocarbons and printing ink residues in paper, aging effects of reusable materials, and the suitability for recycling (mono-material, labelling, minimum recycled content).

- Implement multi-actor approach by involving a wide range of food packaging actors and consumers and conducting inter-disciplinary research.
- Support social innovation for inclusive and long-term solutions aiming at the reduction of plastic food packaging.

The proposals may:

- build links with the European Mission ‘Restore our ocean and waters by 2030’, in particular with the Mission activities under objective 2 – prevent and eliminate pollution in our ocean, seas and water, and with the Mission lighthouse activities in the Mediterranean Sea basin focusing on preventing, minimising, remediating and monitoring pollution;
- build links with the Mission implementation monitoring system;
- build links and support the Mission’s knowledge and information system (Digital Twin Ocean), in particular by contributing to pollution monitoring, modelling, and knowledge creation and data.

Proposals must implement the ‘multi-actor approach’ and ensure adequate involvement of researchers, food business operators, food packaging producers, developers of sustainable packaging, packaging converters and recyclers, consumers, local and regional authorities and other relevant actors.

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines. In order to achieve the expected outcomes, international cooperation is encouraged.

Call - Clean environment and zero pollution

HORIZON-CL6-2023-ZEROPOLLUTION-02

Conditions for the Call

Indicative budget(s)³²⁰

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project	Indicative number of projects
		2023		

³²⁰ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

			(EUR million) ³²¹	expected to be funded
Opening: 22 Dec 2022				
Deadline(s): 28 Mar 2023 (First Stage), 26 Sep 2023 (Second Stage)				
HORIZON-CL6-2023-ZEROPOLLUTION-02-1-two-stage	RIA	7.00	Around 7.00	1
HORIZON-CL6-2023-ZEROPOLLUTION-02-2-two-stage	RIA	8.00	Around 4.00	2
Overall indicative budget		15.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Halting pollution of air, soil and water

Proposals are invited against the following topic(s):

³²¹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

HORIZON-CL6-2023-ZEROPOLLUTION-02-1-two-stage: Optimisation of manure use along the management chain to mitigate GHG emissions and minimize nutrients/contaminants dispersion in the environment

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must apply the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: In line with the farm to fork strategy, the methane strategy, the EU zero pollution action plan and the UN Sustainable Development Goals, the successful proposal will support research and innovation (R&I) to help farm business reduce local and global GHG and ammonia emissions from livestock farming systems. It will contribute to support policy makers with enhanced knowledge to limit emissions and investigate further measures, inter alia under the common agricultural policy, to achieve reduction targets of 2030 and beyond.

The proposed project is expected to contribute to the reduction of the environmental and climate footprint of the livestock farming systems, through a better understanding of i) the potential of scaling up efficient and innovative manure management practices and technologies, and ii) the impact of emission abatement and contaminant reduction measures on health and environment (air, water and soil) safety.

Activities under this topic will contribute to all of the following outcomes:

- Improved cost-effective solutions to reduce greenhouse gas (GHG) emissions and atmospheric, air, water and environment pollutants produced by the livestock manure management chain, both in conventional and organic livestock farming
- Boosted uptake of improved and innovative practices and technologies to optimise manure management (while considering potential trade-offs)
- Improved capacity to better manage manure nutrients, minimizing their losses, increasing circularity and matching demand and supply
- Policy recommendation on improving manure management to mitigate GHG and ammonia emissions and minimize dispersion of undesirable manure components such as biological and chemical contaminants in the environment.

Scope: Agriculture is a sector that significantly contributes to GHG emissions in EU and to air pollution, mainly through ammonia emissions. Reducing the environmental and climate footprint of the livestock farming system is therefore of paramount importance. Several practices and technical measures to limit emissions from manure management are already available. Some other techniques are still considered experimental. Despite major advancements, there is still no widespread application of these practices and further research is needed to assess their socio-economic and environmental impacts. Furthermore, there is the need to do a comprehensive analysis of the effectiveness of mitigation strategies along the entire manure management chain and to take into account different GHGs and the pollution swapping effect, i.e. decreasing the emission of one GHG that can cause the increase of another one or the increase of the emission of the same GHG at one of the other stages of manure management.

Another important aspect of manure management is to reduce environmental pollution caused among others by ammonia emissions, excess of nitrogen and phosphorus, by nitrate leakages, and by different components of manure, including potential contaminants, on air and water quality, on soil health, on animal health, welfare and productivity and on human health.

Therefore, there is the need to develop further strategies and technologies for livestock farming systems to reduce GHG, ammonia and nitrate emissions from manure through an integrated approach for the management of manure, taking into account all steps: feeding, housing, handling, collection, treatment, storage and application. The following elements should be incorporated:

- Identify and establish inventory of up-to-date manure management practices, technologies and data originating from R&I activities (from feeding to low-emission manure storage and processing, composting, exchange of manure/slurries between livestock and crop farms, manure additives to reduce emissions, etc.) in conventional/intensive, semi-intensive, household and organic livestock farming systems;

- Improve or develop lifecycle assessment methods, models and equipment for the measurement and monitoring of GHG (CH₄, N₂O), atmospheric and air pollutants (NH₃, NO_x) at each stage of manure management practices, from feeding to field application;
- Improve knowledge on the fate and persistence in the environment (e.g., water, soil, air) of manure chemicals and biological contaminants, including pathogens antibiotic resistance genes, heavy metals and associated health/environmental risks;
- Demonstrate and test the most efficient strategies and technologies to mitigate GHG emissions and air pollutants from manure at regional/local scale. Activities should take into account relevant practices, strategies and data on GHG, atmospheric and air pollutants mitigation from several livestock farming systems, covering conventional/intensive, semi-intensive, grazing/low input or organic, in different climate/biogeographical regions;
- Cost-benefit assessment of practices/technologies used to mitigate GHG emissions, air pollutants and nitrate emissions from manure, including assessment of pollution swapping effects, trade-offs and co-benefits on animal (e.g., health and welfare, production efficiencies) and environment (e.g., ammonia emissions, nitrate leakage, nitrogen balance and P losses to water);
- Formulate technical guidelines and policy recommendation to enhance the implementation and uptake of methods, technologies or practices to limit emissions and contaminants from manure management.

The proposal should take into account other EU-funded projects, including those funded under the ERA-NETs SusAn³²² and ERA-GAS³²³. Proposals should be based on a gap analysis taking into account the existing legislation³²⁴ and related knowledge.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of the farming sector, agricultural advisory services, manufacturers, ecology and nature conservation experts, and other relevant actors.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Due to the scope of this topic, international cooperation is strongly encouraged, in particular with China. This topic is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative

³²² <https://era-susan.eu/>.

³²³ <https://eragas.eu/en/eragas.htm>.

³²⁴ Such as Directive 2000/60/EC on the water framework directive; Directive 91/676/EEC on protection of waters against pollution caused by nitrates from agricultural sources; Directive 2010/75 on Industrial Emissions; Directive 2016/2284 on the reduction of national emissions of certain atmospheric pollutants.

research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

Actions will contribute to implementing the EU-China Food, Agriculture and Biotechnology (FAB) flagship initiative, which aims to ensure sustainability of agri-food systems, catering for the needs of a growing population, the reduction of food and agricultural losses and waste, and the provision of safe and healthy foodstuffs. Interaction with other actions developed under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and the Flagship on Food, Agriculture and Biotechnologies (FAB) is encouraged if relevant.

Increasing environmental performance and sustainability of processes and products

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION-02-2-two-stage: Safe-and-sustainable-by-design bio-based platform chemicals, additives, materials or products as alternatives

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Successful proposals will address expected impacts under the Destination ‘Clean environment and zero pollution’ and in line with: the European Green Deal’s zero pollution ambition, the bioeconomy strategy, the chemicals strategy for sustainability, and the chemicals transition pathways, via R&I in bio-based safe-and-sustainable-by-design (SSbD)

solutions for a variety of applications. Bio-based solutions' design and assessment is expected to also go beyond compound/material-level considerations, with an additional reflection on end-use and final application(s).

Projects are expected to contribute to:

- Enable circularity(-by-design) of final products, predominantly in applications where recyclability is currently hindered or very challenging, especially due safety implications;
- In addition to fossil-feedstock substitution, reduce the dependency on or replace harmful substances, in particular in materials and formulations, leading eventually to safe(r) (low human and eco-toxicity) final bio-based products, while meeting overall environmental sustainability requirements;
- Build on a portfolio of promising bio-based solutions showing potential for scaled up production and future market uptake of alternative, safe, circular and sustainable bio-based products.

Scope: To deliver on the expected outcome, proposals should:

- Perform a wider scoping exercise, including opportunities and challenges, to propose priority areas³²⁵ and which (optimised or novel) bio-based solutions (chemicals, materials) show 'solid' potential as safer and sustainable alternatives/substitutes. This 'exercise'/analysis should especially cover, but not only, areas where substances of very high concern (SVHC), substances of concern, persistent organic pollutants or legacy additives are currently in (end) use (e.g. textiles, plastics value chains);
- Select chemicals/group of chemicals/(advanced)materials/products and justify. Proceed then with design, (process) development and testing (to targeted TRL) of the chosen bio-based alternatives;
- Embed and assess functionality and value chain considerations for any novel solutions designed and developed, providing equivalent or improved functional performance versus existing and specified benchmarks. Functional performance should be assessed together with showcasing benefits on safety and environmental performance.
- Integrate the safe-and-sustainable-by-design (SSbD) framework, developed by the Commission, for assessing the safety and sustainability of chemicals and materials.³²⁶

³²⁵ Thematic priority areas can span across one or more of the following critical areas: i) materials functionality (e.g., repelling water, grease and dirt, fire safety, plasticizing) to ii) formulation applications (e.g., preservation, solvents, and surfactants and where relevant also to iii) process applications (e.g., solvents, process regulation agents and surface protection). This list is not exhaustive.

³²⁶ See documents defining the SSbD framework and criteria on: https://ec.europa.eu/info/research-and-innovation/research-area/industrial-research-and-innovation/key-enabling-technologies/advanced-materials-and-chemicals_en.

- Contribute with and develop recommendations that can advance further the application of the SSbD framework.³²⁷ More specifically, provide thresholds that can support the criteria definition and improvements for the assessment SSbD methodologies, including any specificities related with bio-based chemicals and materials. Recommendations should also include identification of data gaps, especially safety, environmental, but also socio-economic factors, as well as priorities for data collection.
- Contribute with relevant data generated, along targeted value chain(s) (e.g. with regards to the bio-based substance/group of chemical substances or material). Projects have to make data, results and methodologies FAIR. They are also encouraged to link with trusted repositories for data, results and methodologies.

Where relevant, proposals should seek links and synergies and capitalise on the results of past and ongoing EU research projects (including the Bio-based Industries Joint Undertaking (BBI JU) /Circular Bio-based Europe Joint Undertaking (CBE JU)). This topic has important synergies and complementarities with Horizon Europe Cluster 4 calls (including its PPPs) as well as ongoing projects that should be taken into account.^{328,329, 330}

Proposals should also include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and other relevant topics.

Call - Clean environment and zero pollution

HORIZON-CL6-2024-ZEROPOLLUTION-01

Conditions for the Call

Indicative budget(s)³³¹

³²⁷ Idem.

³²⁸ SSbD topics in Cluster 4 WP 23-24, broader than bio-based chemicals and materials: HORIZON-CL4-2023-RESILIENCE-01-21: Innovative methods for safety and sustainability assessments of chemicals and materials (RIA), HORIZON-CL4-2023-RESILIENCE-01-22: Integrated approach for impact assessment of safe and sustainable chemicals and materials (RIA), HORIZON-CL4-2023-RESILIENCE-01-23: Computational models for the development of safe and sustainable by design chemicals and materials (RIA), HORIZON-CL4-2024-RESILIENCE-01-24: Development of safe and sustainable by design alternatives (IA) as well as European Partnership on Assessment of Risks from Chemicals (PARC).

³²⁹ Cluster 4, WP 21-22: HORIZON-CL4-2021-RESILIENCE-01-08: Establishing EU-led international community on safe-and-sustainable-by-design materials to support embedding sustainability criteria over the lifecycle of products and processes, HORIZON-CL4-2021-RESILIENCE-01-11; Safe- and sustainable-by-design polymeric materials, HORIZON-CL4-2021-RESILIENCE-2021-01-12; Safe- and sustainable-by-design metallic coatings and engineered surfaces and HORIZON-CL4-2022-RESILIENCE-01-23; Safe- and sustainable-by-design organic and hybrid coatings.

³³⁰ As appropriate, also consult the future 'EU Strategic Research and Innovation Plan for chemicals and materials'.

³³¹ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³³²	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-ZEROPOLLUTION-01-1	IA	27.00	Around 9.00	3
HORIZON-CL6-2024-ZEROPOLLUTION-01-2	CSA	4.00	Around 2.00	2
HORIZON-CL6-2024-ZEROPOLLUTION-01-3	RIA	7.00	Around 7.00	1
Overall indicative budget		38.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

³³² Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Halting pollution of air, soil and water

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-ZEROPOLLUTION-01-1: Demonstrating how regions can operate within safe ecological and regional nitrogen and phosphorus boundaries

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 9.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 27.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 8 by the end of the project – see General Annex B.

Expected Outcome: Successful proposals will deliver, to all actors involved in nitrogen (N) and phosphorus (P) emitting activities in a given region, a demonstrated set of measures to limit N/P emissions and re-balance N/P flows within safe ecological boundaries at regional and local scale, thereby contributing to restoring ecosystems in line with the European Green Deal and the EU zero pollution action plan.

Projects results are expected to contribute to all of the following expected outcomes:

- Best practice, including technical and governance solutions, to reduce N/P emissions into water, air and soil from all emitting sectors, in line with relevant EU limit values;
- Demonstrated environmental, economic and behavioural effects of aforementioned N/P limiting solutions while promoting local and regional sustainability and circular economy schemes;
- Comprehensive guidance on sustainable and circular practices to control regional N/P flows at regional level in the EU, and recommendations to relevant actors (policymakers, local administrations, practitioners, industries etc.).

Scope: Building on recent innovations in regional N/P budgeting and quantification methodologies to ensure good status for air, water and soil ecosystems, this Innovation Action should demonstrate how to apply optimised N/P budgets, based on maximum allowable inputs of N/P at a regional/river basin scale, and create the necessary systemic and multi-actor transition pathways to ensure a sustainable integrated N/P management in the future. The aim is to show how N/P-relevant sectors (e.g., agriculture, aquaculture, forestry, industrial sectors, food/drink sector, water supply, water/waste management, bioenergy, fossil-based energy production, mining activities, transport, unintentional losses through leaching and run-off of

agricultural nutrients etc.) in a given region can limit N/P emissions to air, water and soil from their activities by respecting pre-established regional N/P budgets and applying N/P balancing practices. N/P-balancing practices comprise activities that enhance the sustainability and circularity of N/P relevant resources and services between urban/industrial and rural/coastal environments and apply respective governance measures. Finally, it will be essential to develop comprehensive guidelines to disseminate best practices and techniques to all involved actors.

Proposals should:

- Implement a reliable N/P budgeting methodology to identify the maximum allowable input of N/P at regional/river basin scale and ensure good status for air, water and soil ecosystems. N/P budgets should stay within safe ecological and regional boundaries, i.e. by respecting limit values of N/P in air, water and soil, as specified in existing EU legislation³³³ or based on recent scientific evidence³³⁴ and complying with the precautionary principle.
- Demonstrate single or integrated region-specific practices in all relevant N/P sectors that help balance emissions from N and P-based fertilisers in agriculture, enhance soil health, reduce eutrophication and water pollution and limit harmful emissions to air.
- Showcase how innovative governance models can contribute to fostering ecologically responsible and sustainable use, recovery and exchange of N/P relevant resources, services and infrastructures between urban/industrial and rural/coastal environments while meeting overarching EU objectives (farm to fork and biodiversity strategies).
- Test innovative practices and technologies to make use of secondary raw materials and produce N and P-based fertilisers recovered from organic waste, wastewater, biological residues or by-products and promote local and regional value chains.
- Apply novel governance approaches and other incentives supporting practices to limit N/P emissions and develop respective guidelines and recommendations for all concerned stakeholders (local and regional authorities, municipalities, environmental organisations, farmers and other practitioners industry, civil society etc.), to encourage behavioural change and public acceptance of recovered products as well as more effective problem-solving mechanisms while envisaging regional twinning and mentoring schemes.
- Disseminate results and best practice to all stakeholders involved across the EU and Associated Countries, and provide recommendations on the design of harmonised, coherent and efficient regional policies and regulatory instruments that facilitate eliminating and preventing N/P pollution.

³³³ EU Water Framework Directive, Nitrates Directive.

³³⁴ EEA 2020, Is Europe living within the limits of our planet? An assessment of Europe's environmental footprints in relation to planetary boundaries' <https://www.eea.europa.eu/publications/is-europe-living-within-the-planets-limits>.

Applicants are encouraged to join different regional clusters per project and to diversify their proposed consortia by involving a wide range of relevant stakeholders, such as primary producers and practitioners, local and regional administrations, municipalities, related industries, environment organisations, academia, civil society, citizens, etc.

The projects funded under this topic are expected to build close links and exchange knowledge and information with the Horizon Europe Mission “Restore our Ocean and Waters by 2030”. In particular, they should link to the Mission activities under Objective 2 – “Prevent, minimise and eliminate pollution in marine and freshwater environment”, and to the Mission lighthouse activities in the Mediterranean sea basin focusing on the prevention, reduction and elimination of all kinds of pollution in marine and freshwater ecosystems, including pollution from excess nutrients (phosphorus and nitrogen).

This topic will be part of the demonstration projects for the implementation of the European Commission’s Circular Cities and Regions Initiative (CCRI) and must be carried out in close cooperation with it.

SSH aspects should be included.

HORIZON-CL6-2024-ZEROPOLLUTION-01-2: Best available techniques to recover or recycle fertilising products from secondary raw materials

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³³⁵ .

³³⁵ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Expected Outcome: Successful proposals will deliver recommendation to policy makers and stakeholders on the alternative fertilising products able to balance nitrogen (N) and phosphorus (P) flows within safe ecological boundaries at regional and local scale, thereby contributing to restoring ecosystems. Projects will contribute to deliver alternative fertilising products with reduced environmental impacts on soil, water, and air quality, biodiversity and climate, in line with the European Green Deal and the EU zero pollution action plan.

Projects results are expected to contribute to all of the following expected outcomes:

- Lower environmental impacts on soil, water, and air quality, biodiversity and climate from alternative fertilising products recovered from secondary raw materials;
- Circular use of alternative fertilising products recovered from secondary raw materials;
- Best available techniques for recovering/recycling fertilising products from secondary raw materials, in terms of technical feasibility, environmental performance and socio-economic aspects: collection and sharing among European and international stakeholder.

Scope: The scope of this CSA is the analysis of best available technologies for recovering/recycling fertilising products from secondary raw materials in Europe while limiting nitrogen and phosphorus pollution in soil, water and air and any other form of pollution from the use of such fertilising products and from the replacement of nitrogen- and phosphorus-based fertilisers produced from conventional processes (including mining and fossil-based processes). Examples of fertilising products within the scope are: recycled nutrients from urban and industrial waste water and sewage sludge, organic fertilising products from bio-waste, digestate and treated manure as well as other fertilising products from biological resources.

To deliver on the expected outcomes, proposals should:

- Collect data on case studies of existing installations converting secondary raw materials into fertilising products in Europe and outside. Secondary raw materials should include: urban and industrial waste water and sewage sludge, bio-waste, digestate, treated manure, others. Case studies of existing installations should range in volume and type of secondary materials treated, as well as in technologies employed in the installations;
- Analyse the technical aspects of the available technologies, such as on the characterisation of secondary raw materials, the recovery/recycling processes and their environmental impacts on soil, water and air quality, biodiversity and climate, their resources efficiency (including energy), as well as the pollution prevention operations. The analysis should also include the assessment of the costs for installation, maintenance and upgrade of both recovery/recycling and pollution prevention operations;
- Compare the environmental impacts and the resources efficiency (including energy) of the available technologies in the scope with the impacts of the conventional processes producing nitrogen- and phosphorus-based fertilisers. The comparison should be performed based on appropriate selection of the functional unit;

- Analyse the fertilising products from each case study selected at the first step: e.g., their composition (in a range of values of main components, following the current content of labelling provisions of EU fertilising products), with special focus on any potential polluting substance, including microplastics and persistent substances and their impacts on soil, water, air quality, biodiversity and climate, their suggested use and management, especially preventing the emissions of nitrogen and phosphorus to the environment but also any other pollutants, their compliance with certifications and labels, etc.;
- Analyse the market and the regulatory framework of the identified practices (according to the EU legislation, certification and standardization schemes) and their potential to enable or prevent the wider uptake of these technologies;
- Analyse the technical availability of feedstock supply and potential to upscale the identified practices and the production of fertilising products from secondary raw materials;
- Select the best available technologies based on: the analysis carried out on the whole database of case studies, the market and the regulatory framework and the availability of feedstock supply. The best techniques should meet the best performances, especially in terms of lower impacts on soil, water, and air quality, biodiversity and climate;
- Deliver specific datasheets of relevant techniques with their technical and environmental performances, as well as with economic and social analysis;
- Build links with the European Mission ‘Restore our ocean and waters by 2030’, in particular with the Mission activities under objective 2 – *prevent, minimise and eliminate pollution in marine and freshwater environment, and with the Mission lighthouse activities in the Mediterranean sea basin focusing on prevention, reduction and elimination of all kinds of pollution in marine and freshwater ecosystems, including pollution from excess nutrients (phosphorus and nitrogen)*;
- Build links with the European Mission ‘A Soil Deal for Europe’, especially with the activities under objective -*reduce soil pollution and enhance restoration*.
- Provide recommendations to policy makers and practitioners to ensure the deployment of the best available technologies preventing the emissions of nitrogen and phosphorus to soil, water and air;
- Establish a forum of stakeholders from the whole supply and value chain, in order to feed the projects with advice and discussion and share best practices eventually. The forum will be open to stakeholders from Europe and outside.

Applicants from different groups of stakeholders will cover all the technical, environmental, economic and social aspects of supply chains of secondary raw materials, installations and processes converting those materials into fertilising products and end users.

In order to achieve the expected outcomes, and in line with the EU strategy for international cooperation in research and innovation, international cooperation is encouraged.

Where relevant, proposals should seek links with and capitalise on the results of past³³⁶ and ongoing EU funded projects³³⁷.

The projects funded under this topic should develop their tasks in synergy, in order to select the best available technologies on the broader base of case studies, possibly covering all different conditions in Europe (i.e., different secondary raw materials available, different techniques, regulatory and market frameworks, etc.). The projects should also establish common formats of the specific datasheets of relevant techniques and of the recommendations to policy makers and practitioners, both described in the scope. Moreover, they should establish together the forum of stakeholder, which will be unique for all projects.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Reducing the environmental impact and pollution in food systems

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-ZEROPOLLUTION-01-3: Environmental impacts of food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use

³³⁶ See for example <https://sea2landproject.eu/> and projects under BBI JU <https://www.bbi.europa.eu/projects/b-ferst>, <https://www.bbi.europa.eu/projects/newfert>.

³³⁷ See for example HORIZON-CL6-2021-ZEROPOLLUTION-01-09: Environmental impacts and trade-offs of alternative fertilising products at global/local scale.

	the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
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Expected Outcome: The food sector contributes to food security but is also responsible for air, water and soil pollution. It can contribute to biodiversity loss, soil erosion and climate change, and it consumes excessive amounts of natural resources, including water and energy, while a significant amount of food is wasted. In supporting the implementation of the European Green Deal, the EU zero pollution action plan, the farm to fork strategy, the European climate pact, the common agricultural policy and the common fisheries policy and the Food 2030 initiative, the successful proposal should address all of the following outcomes:

- Increased overall knowledge of the environmental and climate impacts stemming from the food systems, including potential trade-offs/synergies with other sustainability aspects (environmental, social, economic).
- Robust evidence-based understanding of the impacts of food systems related to direct and indirect soil, water and air pollution that drive biodiversity losses, soil erosion, climate change and can negatively affect human health.
- Improved capacity to reduce the environmental and climate impacts of food systems, particularly in relation to pollution.
- Support to actors across the food systems through new available knowledge, shared existing data on environmental and climate impacts of food systems and identification of innovative solutions.

Scope: There is an increasing understanding of the impacts related to the green-house gas (GHG) emissions stemming from food systems. Around one third of human-caused GHG emissions worldwide originate from food systems.³³⁸ A similar share of emissions is also recorded in Europe. Although the largest share of the GHG emissions and other relevant environmental impacts can be attributed to the primary food production (or harvesting in the case of fisheries), a significant amount of food-related environmental impacts is also generated in post-production and post-harvest processes along food supply chains. However, when considering wider environmental and climate impacts of food systems, more information is needed to understand these impacts, particularly when it comes to pollution stemming from food processing, manufacturing, packaging, distribution, trade, consumption (including emerging food consumption trends, such as products of alternative diets), food waste and end of life practices.

The relevant data covering these latter industries or practices are often less available and/ or accessible compared to the agricultural data, for example through the CAP indicators. At the same time, knowledge gaps also exist when it comes to environmental impacts of primary food production and harvesting. Therefore, the successful proposal should fill the relevant

³³⁸ Crippa, M., Solazzo, E., Guizzardi, D. et al. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat Food* 2, 198–209 (2021).

knowledge and data gaps. It should explain how it will deliver co-benefits to some of the Food 2030 priorities: climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities. The data should be aligned with, and support the relevant objectives of the upcoming Sustainable food system framework initiative.³³⁹

Proposals are expected to:

- Collect relevant qualitative and quantitative data on environmental and climate impacts related to water, air and soil pollution stemming from the food systems, biodiversity losses, climate change and negative impacts on human health, as well as data on freshwater consumption, soil erosion, resource and energy efficiency of food production and supply practices.
- Increase the accessibility of relevant high quality life cycle inventory data according to FAIR principles and the EU's open science policy by setting up actions to develop, review and make available existing databases.
- Provide new data based on requirements for Environmental Footprint compliant datasets³⁴⁰ and in line with the 2021 Recommendation on the use of the Environmental Footprint methods³⁴¹.
- Assess the environmental impacts of food systems from a life-cycle perspective, using the Environmental Footprint methods.
- Identify and map opportunities and innovative solutions, including existing good practices that address the identified impacts and promote the uptake of sustainable food production (including harvesting) and/ or food supply practices, including consumption practices, with minimum impact.
- Identify and map opportunities and innovative solutions, including existing good practices, that maximise synergies among the three dimensions of sustainability (i.e. environmental – including climate and biodiversity, economic, social - including health), different sectors, as well as actors across the food systems (from production/ harvesting to consumption), minimising trade-offs and reducing pollution as well as other environmental and climate impacts in food systems as a whole.
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.
- In order to achieve the expected outcomes, international cooperation is encouraged.

³³⁹ See [f2f_legis_ia_fsfs_5902055.pdf \(europa.eu\)](#)

³⁴⁰ See [JRC Publications Repository - Guide for EF compliant data sets \(europa.eu\)](#).

³⁴¹ Commission Recommendation (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations C/2021/9332, OJ L 471, 30.12.2021, p. 1–396 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021H2279>.

- Where relevant, build on and expand the results of past and ongoing research projects and collaborate with relevant initiatives.

This topic has strong links with destinations “biodiversity and ecosystem services”, “fair, healthy and environment-friendly food systems from primary production to consumption” and “circular economy and bioeconomy sectors”.

Call - Clean environment and zero pollution

HORIZON-CL6-2024-ZEROPOLLUTION-02

Conditions for the Call

Indicative budget(s)³⁴²

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁴³	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 21 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-ZEROPOLLUTION-02-1-two-stage	IA	15.00	Around 5.00	3
HORIZON-CL6-2024-ZEROPOLLUTION-02-2-two-stage	RIA	8.00	Around 4.00	2
Overall indicative budget		23.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General

³⁴² The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁴³ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

	Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Protecting drinking water and managing urban water pollution

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-ZEROPOLLUTION-02-1-two-stage: Holistic approaches for effective monitoring of water quality in urban areas

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: In line with the European Green Deal's zero pollution ambition, successful proposals will contribute to protecting water quality by managing urban water pollution, and consequently also protecting biodiversity and the quality of aquatic ecosystems, as addressed by several impacts under the Destination 'Clean environment and zero pollution', in particular "Move towards achieving clean, unpolluted surface water and groundwater bodies in the EU by advancing the understanding of diffuse and point sources of water pollution in a global and climate change context, enabling novel solutions to avoid degradation and restore water bodies, aquatic ecosystems and soil functionality, and further enhancing water quality and its management for safe human and ecological use, while fostering the EU's and Associated Countries' position and role in the global water scene."

Projects results are expected to contribute to all of the following expected outcomes:

- Enhance urban water quality with a view of providing better guidance for policy making and prioritisation by developing integrated urban water quality monitoring management plans;
- Sound, safer and risk-based urban water quality management plans supported by enhanced holistic monitoring, advanced novel methods and digital solutions, modelling and evidence-based scenarios;
- Increase uptake of digital tools in the water sector to support water management decisions for all stakeholders.

Scope: Water management in urban areas is confronted with a wide range of water quality issues. Urban runoff, is an increasingly important source of pollution. This is going to be aggravated by an increasing frequency of extreme events, such as floods and droughts, due to the impacts of climate change, as well as the increasing sealing of surfaces and rapid growth of urban areas. Moreover, water leakages from ageing water-service infrastructure and combined sewer or storm water overflows, leads to additional pollution releases into the environment. Water quality deterioration due to trace organic pollutants such as pharmaceuticals and industrial chemicals, microbial contaminants, such as pathogens or antimicrobial resistance genes, micro-plastic, nanomaterial, and diffuse pollution from urban areas (roads, urban runoff) and from upstream agricultural areas or industries and many other pollutants often released unintentionally to the environment and finally leading to several forms of pollution of urban water sources. These issues are also exacerbated by the complex interactions between pollutions sources and pathways at the urban/catchment level interface.

In line with the ambition of the EU zero pollution action plan there is a need to develop an integrated and harmonised approach to monitor all sources of surface and groundwater pollution and their impact, including micro-pollutants, micro-plastics, pharmaceuticals and other contaminant of emerging concerns, as well as mixtures of pollutants.

This objective of this action is to develop and demonstrate a European wide 'whole system monitoring approach' to address emerging water pollution and water quality assurance in urban areas in various urban areas covering a wide number of water pollution challenges, ,

taking into consideration the interactions of pollution sources and pathways between urban areas and the surrounding river and where appropriate drainage basin, and improve the resilience of urban water systems towards pandemics and global and climate change challenges. New systemic concepts and holistic strategies to enhance urban water quality should be integrated and demonstrated in an operational environment, including decentralised systems, hybrid green-grey infrastructures or cascading use of water.

An advanced monitoring and control system, going beyond the conventional pollutants, linking drinking and wastewater urban cycles, integrating risk management approaches and exploiting upgraded digital solutions to support urban water quality management, should be developed and tested, combined with appropriate modelling tools and scenarios to assess and forecast the long-term impacts of future changing socio-economic and climatic conditions on water quality. This monitoring system should consider the overall monitoring and outlook requirements of the EU zero pollution action plan, the monitoring requirements of existing EU water policy legislation (e.g., Water Framework Directive, Drinking Water Directive, Urban Waste Water Treatment Directive, Bathing Water Directive, etc.) and relevant national and/or European water quality monitoring tools, and develop recommendations and guidance to strengthen the implementation of the EU and/or national legislation. It should allow to identify cause-effect relationships and big data management to address quality pressures. For this purpose there is a need to develop better methods to access chemical data to be able to track the use or the flows of chemicals in urban areas (e.g., to support case studies using mass balance approach to clarify hotspots of pollution sources). New and refined analytical tools and monitoring methods (e.g. effect-based monitoring, biological monitoring) to analyse broad spectrum of contaminants of emerging concerns should be also developed. Recommendations for the standardisation of monitoring and identification of contaminants (including detection limit) should be also provided.

To enhance the capabilities of real-time monitoring of water quality, the potential of earth observations technologies and the use of digital technologies, such as online sensors, artificial intelligence, digital twins, digital data spaces, etc. should be further explored and consolidated.

In general, the participation of academia, research organisations, utilities, industry and regulators is strongly advised, as well as civil society engagement whenever necessary, also aiming to broaden the dissemination and exploitation routes and to better assess the innovation potential of developed solutions and strategies. The direct participation of urban and catchment/river basin managing water authorities and utilities is essential.

Where relevant, activities should create synergies with the projects funded under the protecting drinking water and managing urban water pollution topics in the work programme from WP2021-2022, namely HORIZON-CL6-2021-ZEROPOLLUTION-01-03 and HORIZON-CL6-2022- ZEROPOLLUTION-01-04.

Increasing environmental performances and sustainability of bio-based processes and products

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-ZEROPOLLUTION-02-2-two-stage: Innovative technologies for zero pollution, zero-waste biorefineries

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 4-5 by the end of the project – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: Successful proposals will support researchers and innovators to improve the environmental performances and circularity of bio-based systems in industrial sectors. Project outcomes will contribute to enhance circular bio-based systems operating according to planetary boundaries, replacing fossil-based systems and their carbon footprint, mitigating climate change and protecting air, water and soil quality along industrial value chains, in line with the European Green Deal and the EU zero pollution action plan.

Projects results are expected to contribute to the following expected outcomes:

- Enhanced environmental performances of bio-based processes approaching the zero-waste, zero-pollution ambition.

- Integrated pollution prevention and control in bio-based systems targeting soil, water and air quality as well as noise levels.

Scope: Pollution from anthropogenic activities undermines the integrity of Earth ecosystems and severely affects the natural resources essential for human life. The EU bioeconomy strategy 2030 sets environmental protection at the basis of the modernisation of bio-based industries in the Union, to ensure a trustful green transition of EU economy away from a linear fossil-based system.

To develop solutions for preventing and controlling pollution from bio-based industries, proposals should:

- Design integrated technical solutions reducing exhaust flows from bio-based processes through innovative technologies of extraction, recirculation, fractionation and conversion of such flows, to reach the zero-pollution ambition starting from the emissions to soil, water and air. The exhaust flows considered should include the ones that are usually not considered in the common pollution prevention and control operations, such as hot water, vapours, odours etc. The reduction of impacts on climate change, based on the reduction of greenhouse gas emissions and accessorially via increase of carbon removals, and on biodiversity should be considered as well;
- Individuate replacement of hazardous substances used in the processes with safe bio-based ones;
- Design the biorefinery operations to re-circulate any process flows such as process air and water and to increase energy efficiency including heat recovery;
- Design the biorefinery operations in order to reduce noise emissions;
- Design circularity of any processes, including through symbiosis between industrial installations to share and exploit materials and carrier streams, and looking on the best practices already available or under development, including in other EU R&I programmes to reach the zero-waste ambition;
- Develop a case-study of integrated zero-pollution technical solutions in a selected biorefinery and design the adaptation of the case-study to be operational at all scales, from the large/medium to the small scale (the latter shows potentially high specific environmental impacts);
- Pilot and validate digital innovation for bio-based processes enabling the zero-pollution and zero-waste biorefinery ambition. Digital tools may include data sharing platforms for the management of supply and value chains, as well as industrial symbiosis operations between biorefineries, industrial hubs, etc.;
- Develop and validate integrated monitoring systems, operated by the industry at the level of the biorefinery, of the effective reduction of pollutant emissions, affecting soil, water and air quality, noise levels and waste production from biorefineries.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects, including under the Circular Bio-based Europe JU and other partnerships of Horizon Europe.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Destination - Land, ocean and water for climate action

Reducing greenhouse gas (GHG) emissions and increasing carbon sinks in primary production and natural systems as well as in harvested wood products and other carbon storage products are key components of the European Green Deal³⁴⁴. Achieving sustainable ocean, water and land management, and using natural resources efficiently to help mitigate climate change implies finding the right balance between productivity, climate, biodiversity and environmental goals in the agriculture and forestry sectors, with a long-term perspective. R&I activities will support **solutions for climate and environmentally friendly practices** to reduce emissions of major greenhouse gases, other pollutants and the environmental impact of ocean and land use changes and agricultural activities. R&I will rely on the application of digital technologies where relevant.

The **EU climate law**³⁴⁵ states that to reach 2030 and 2050 climate targets and to restore biodiversity, the EU needs to immediately and decisively restore and increase its natural carbon sinks. In 2021, the Commission proposed to amend **Regulation (EU) 2018/841 for land use, forestry, and agriculture**³⁴⁶ by setting an increased EU target for net removals of 310 MtCO₂eq by 2030 and allocating targets for each Member State. The proposal also includes the aim to reach climate-neutrality in the entire land sector by 2035, namely that carbon removals should balance the greenhouse gas emissions from land use, livestock and fertiliser use. At the end of 2021, the Commission published a **communication on sustainable carbon cycles**, including **carbon farming** and **certification of carbon removals**³⁴⁷. R&I, new technologies and business models are expected to unlock the full potential of land use, land-use change and forestry (LULUCF) activities in the mitigation of climate change.

Carbon farming will be implemented in line with the communication on sustainable carbon cycles and related documentation. R&I activities under this destination, and in the work programme of the mission ‘A Soil Deal for Europe’ will **help coordinate** the research community and key stakeholders in **developing, testing and demonstrating carbon farming practices and in certifying carbon removals**. Results of funded activities will help in managing land and forests and in delivering of multiple services provided by agricultural land and forests, such as: i) the provision of goods and long-term carbon storage in harvested wood products, ii) protection of soils, water and biodiversity; and iii) mitigation of and adaptation to climate change.

Specific attention will be given to paludiculture, complementing the activities of Cluster 5 in the 2021/2022 work programme. R&I activities will help increase soil organic carbon, protect carbon-rich soils (e.g. grasslands and peatlands), restore peatlands and wetlands, and improve advisory services for land managers. Together with the work programme for the mission ‘A

³⁴⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN>

³⁴⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119&from=EN>

³⁴⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0554>

³⁴⁷ https://ec.europa.eu/clima/system/files/2021-12/com_2021_800_en_0.pdf

Soil Deal for Europe', R&I activities will aim to reduce the financial burden resulting from the costs of management practices in carbon farming and the uncertainty about revenue possibilities. In the livestock sector, R&I on manure management will help **implement the EU methane strategy**³⁴⁸. R&I activities will also boost the contribution made by a forest **as a natural and man-made carbon sink** and maintain multiple ecosystem services (e.g., water replenishment, soil protection), as proposed in the **Fit for 55** package with the revised LULUCF Regulation and the new **EU forest strategy**.

Strengthening the **nexus between the ocean and climate change** is a priority for the EU. There is growing political awareness of the importance of ocean and polar regions as integral parts of the Earth's climate system and of the need to ensure the integrity and resilience of these vulnerable ecosystems in the context of climate change. The main outcomes expected are an improved understanding of the ocean's role in the Earth's climate system, resulting in the closing of the research gaps on ocean essential climate variables and improved ocean models for seasonal to decadal forecasting at local and regional scales. This in turn will support decision-making aimed at preserving the integrity of the ocean and aquatic ecosystems and the polar Regions, through a better understanding of the drivers of change and of emerging threats, including tipping points. The ocean is also a large storage system for the global reservoirs of climate-regulating factors, particularly carbon. R&I will advance knowledge innovations to develop ocean-based solutions/mitigation options, helping to close the emissions gap and stop ocean acidification and prevent the consequent biodiversity losses.

The following blue carbon ecosystem developments could be envisaged:

- more knowledge about identifying regions at risk;
- exploring, preserving, restoring or even creating new natural habitats, and providing solutions to strengthen resilience and protection of EU coastal areas against climate change;
- more knowledge and data on blue carbon quantification;
- consider nature-based solutions for carbon farming, e.g. on coastal wetlands, as well as seaweed and mollusc aquaculture.

Biodiversity protection plays an important role in all approaches for mitigation in ecosystems and Nature-based Solutions (NBS) are highly important in this context, providing further environmental, social and economic benefits. Building on the political momentum gained at COP25 where the ocean was identified as a priority, and on the latest developments at COP26, science on the climate and the ocean nexus developed under the Horizon Europe programme will contribute to and inform the dialogue under the United Nations Framework Convention on Climate Change (UNFCCC) on the ocean and climate change.

Other major contributions include: i) providing new scientific knowledge on polar regions for the **EU Arctic policy**; ii) supporting the new policy initiative on **sustainable blue economy**

³⁴⁸ https://ec.europa.eu/energy/sites/ener/files/eu_methane_strategy.pdf

and its offshoot initiatives as well as implementing the **Marine Strategy and Water Framework Directives**; and iii) helping to achieve the **clean planet for all's** aim of neutralising all major threats to the health of the planetary ecosystem.

In line with the **climate adaptation strategy**³⁴⁹, climate action also calls for ecosystems, primary production, food systems and the bioeconomy to adapt to climate change. Climate change is exacerbating existing risks to livelihoods, biodiversity, human and ecosystem health, infrastructure and food systems. Human activities relying on the availability and use of clean water are particularly affected by variable and extreme weather events, which may also lead to desertification. Agriculture and forestry in the EU are vulnerable to climate change. Specifically, there is growing evidence about the effects of climate change and extreme weather events, which need to be mitigated, on agricultural production, crop yields, and also on the forest sector.

In the area of forestry, R&I will improve knowledge on the interactions and interdependencies between biodiversity and climate change, and identify win-win management strategies, also addressing trade-offs in a sustainable manner. Marine and coastal areas are also threatened by the rise in sea level, saline water intrusion, biodiversity loss, ocean acidification, extreme events and a shrinking cryosphere. R&I will, therefore, be critical to stepping up adaptation and building resilience in agriculture, forestry, and activities in marine and coastal areas. They will aim to deliver on the urgent need to step up the adaptation of primary production, notably by providing farmers and other actors in bioeconomy value chains with better-adapted crop varieties and animal breeds with lower impacts on the related ecosystems.

R&I efforts are critical to avoiding, reducing and reversing desertification. They are also critical to delivering sustainable nature-based solutions that will also i) increase carbon sequestration, natural water retention, biodiversity conservation and restoration, ii) strengthen coastal protection, iii) reduce the risks of algal blooms and iv) offer ecotourism opportunities. Water adaptation strategies and approaches will be developed and tested. In this context, the innovation potential for a wide range of alternative water solutions (rainwater harvesting, storm water collection, water reuse and reclamation, brackish and sea water desalination, aquifer recharge, etc.) to be used for avoiding possible negative environmental impacts will be assessed and the European partnership for ensuring water security for the planet will be further supported. Potential trade-offs, and measures to mitigate and avoid them, will be assessed to ensure environmental sustainability and to keep the objectives of improving soil fertility, increasing carbon storage in soils and biomass to support benefitting agricultural productivity and food security and reduce biodiversity loss. R&I will also aim at providing a better understanding of how institutions and behaviour shape vulnerability and offer opportunities for adaptation.

³⁴⁹

https://ec.europa.eu/clima/eu-action/adaptation-climate-change/eu-adaptation-strategy_en

Expected outcomes include, by means of international cooperation, collaborative research on joint adaptation, mitigation and biodiversity reporting and monitoring of land contributing to the overall areas targeted in Cluster 6³⁵⁰.

Expected impacts

Proposals for topics under this destination should set out credible pathways that contribute to **climate action on land - including forestland, grassland, cropland and wetland - as well as on oceans and water** and more specifically to one or several of the following impacts:

- better understanding and strengthening of the mitigation potential of ecosystems and sectors based on the sustainable management of natural resources;
- advancement of science and technology to support the **adaptation and resilience of natural and managed ecosystems**, on land, in the ocean, in water and soil systems as well as economic sectors in the context of the changing climate, including interaction with drivers of biodiversity change and zero pollution;
- efficient monitoring, assessment, modelling and data-driven decision-making support systems and projections related to **climate change impacts, mitigation and adaptation potential** in order to derive solutions for tackling existing and emerging threats and support decision-making in climate change mitigation and adaptation policies at European and global levels, including through the use of AI and other digital solutions;
- increased **climate change mitigation in the primary sectors**, including by means of reducing their GHG emissions and other pollutants, maintaining **natural and man-made carbon sinks** and increasing uptake and storage of carbon in ecosystems, taking into account trade-offs with regard to ecosystems;
- improved **capacity to climate change** of the ocean, sea, water and soil systems and related sectors to adapt to climate change, including by means of unlocking the potential of nature-based solutions;
- **sustainable management of scarce resources**, in particular soils and water, therefore mitigating climate related risks, especially desertification and erosion, thanks to informed decision-makers and stakeholders and the integration of adaptation measures in relevant EU policies.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023-CLIMATE-01	86.00	22.00	12 Apr 2023

³⁵⁰ This refers in particular to potential EU-China cooperation under the Climate Change and Biodiversity (CCB) Flagship.

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HORIZON-CL6-2024-CLIMATE-01		75.00	22 Feb 2024
Overall indicative budget	86.00	97.00	

Call - Land, ocean and water for climate action

HORIZON-CL6-2023-CLIMATE-01

Conditions for the Call

Indicative budget(s)³⁵¹

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million) ³⁵²	Indicative number of projects expected to be funded
		2023	2024		
Opening: 22 Dec 2022 Deadline(s): 12 Apr 2023					
HORIZON-CL6-2023-CLIMATE-01-1	COFUND	14.00	22.00	Around 36.00	1
HORIZON-CL6-2023-CLIMATE-01-2	IA	10.00		Around 3.30	3
HORIZON-CL6-2023-CLIMATE-01-3	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-CLIMATE-01-4	RIA	20.00		Around 20.00	1
HORIZON-CL6-2023-CLIMATE-01-5	CSA	5.00		Around 5.00	1
HORIZON-CL6-2023-CLIMATE-01-6	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023-CLIMATE-01-7	RIA	5.00		Around 5.00	1

³⁵¹ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁵² Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

HORIZON-CL6-2023-CLIMATE-01-8	IA	17.00		5.00 to 6.00	3
Overall indicative budget		86.00	22.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CLIMATE-01-1: Additional activities for the European Partnership Water Security for the Planet (Water4All)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 36.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 36.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The proposal must be submitted by the coordinator of the consortium

	<p>funded under HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet (Water4All). This eligibility condition is without prejudice to the possibility to include additional partners.</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p>
<p><i>Procedure</i></p>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The evaluation committee will be composed partially by representatives of EU institutions.</p> <p>If the proposal is successful, the next stage of the procedure will be grant agreement amendment preparations.</p> <p>If the outcome of amendment preparations is an award decision, the coordinator of the consortium funded under HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet (Water4All) will be invited to submit an amendment to the grant agreement, on behalf of the beneficiaries.</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>This action is intended to be implemented in the form of an amendment of the grant agreement concluded pursuant to topic HORIZON-CL6-2021-CLIMATE-01-02.</p> <p>For the additional activities covered by this action:</p> <ul style="list-style-type: none"> • The funding rate is 30% of eligible costs. • Beneficiaries may provide financial support to third parties (FSTP). The support to third parties can only be provided in the form of grants. • Financial support provided by the participants to third parties is one of the primary activities of this action in order to be able to achieve its objectives. The 60 000 EUR threshold provided for in Article 204 (a) of the Financial Regulation No 2018/1046 does not apply. • The maximum amount of FSTP to be granted to an individual third party is EUR 10 000 000. This amount is justified since provision of FSTP is one of the primary activities of this action and it is based on the extensive experience under predecessors of this partnership.

	<ul style="list-style-type: none"> • The starting date of grants awarded under this topic may be as of the submission date of the application. Applicants must duly justify the need for a retroactive starting date in their application. Costs incurred from the starting date of the action may be considered eligible (and will be reflected in the entry into force date of the amendment to the grant agreement).
<i>Total indicative budget</i>	The total indicative budget for the duration of this partnership is EUR 126 million.

Expected Outcome: This topic is for the continuation of the European Partnership Water Security for the Planet (Water4All), i.e. EU contribution in WP 2023-2024.

The second instalment of the partnership is expected to contribute to expected outcomes specified in topic HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet (Water4All), for continuation and new development of activities.

Scope: The objective of this action is to continue to provide support to the European Partnership Water4All identified in the Horizon Europe Strategic Plan 2021-2024 and first implemented under the topic HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet, and in particular to fund additional activities (which may also be undertaken by additional partners) in view of its intended scope and duration, and in accordance with Article 24(2) of the Horizon Europe Regulation.

The consortium which applied to and received funding under HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet is uniquely placed to submit a proposal to continue the envisioned partnership. Not only did this consortium submit the proposal leading to the identification of the partnership in the Horizon Europe strategic planning 2021-2024, it has also implemented the partnership through co-funded calls in 2021 and 2022 based on this planning and further to topic HORIZON-CL6-2021-CLIMATE-01-02. In this context, the current consortium has particular expertise in relation to the objectives of the Partnership, the activities to be implemented, in particular FSTP calls or other calls/scope of calls clearly required/envisioned pursuant to initial proposal/partnership, and other relevant aspects of the action. In practice, another consortium could not continue the activities of the Partnership underway without significant disruption to the ongoing activities, if at all.

The scope of the application for this call on the European Partnership Water Security for the Planet should focus on the 2023-27 programmes according to the partnership's co-created strategic research and innovation agenda for seven years, which includes joint calls for research projects, activities to fostering the uptake of R&I results from various stakeholders, living labs and demonstration sites activities to demonstrate the efficiency of innovative solutions, activities to enhance international collaborations and support the achievement of the water related UN SDGs and transfer of in foreign contexts, where specific challenges can be encountered. Actions to ensure coordination and alignment of EU, national and regional

programmes, to strengthen the research/policy interface and all horizontal activities to allow the Partnership to operate and to achieve its specific objectives should be also addressed.

It is expected that the partnership continues to organise joint calls on an annual base and therefore it should factor ample time to run the co-funded projects.

Specific activities to strengthen the synergies of Water4All partnership with the related Missions and Partnerships, identified in the proposal submitted by the coordinator of the consortium funded under HORIZON-CL6-2021-CLIMATE-01-02 should be also described.

While the award of a grant to continue the Partnership in accordance with this call should be based on a proposal submitted by the coordinator of the consortium funded under HORIZON-CL6-2021-CLIMATE-01-02: European Partnership Water Security for the Planet (Water4All) and the additional activities (which may include additional partners) to be funded by the grant should be subject to an evaluation, this evaluation should take into account the existing context and the scope of the initial evaluation as relevant, and related obligations enshrined in the grant agreement.

Taking into account that the present action is a continuation of topic HORIZON-CL6-2021-CLIMATE-01-02 and foresees an amendment to an existing grant agreement, the proposal should also present in a separate document the additional activities and additional partners, if any, to be covered by the award in terms of how they would be reflected in the grant agreement.

The partnership should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joints call for transnational proposals resulting in grants to third parties.

The Commission envisages to include new actions in future work programmes to continue providing support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2023-CLIMATE-01-2: Improve the reliability and effectiveness of alternative water resources supply systems and technologies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.30 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply:

	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
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Expected Outcome: In support of the European Green Deal and EU water-related policies, successful proposals will contribute to fostering the adaptation of water resources to climate change, in particular the expected impact of the Destination ‘Land, ocean and water for climate action’ to “Advance understanding and science to support adaptation and resilience of natural and managed ecosystems, ocean, water and soil systems and economic sectors in the context of the changing climate”.

Projects results are expected to contribute to all of the following expected outcomes:

- Recommendations on alternative water resources options in water scarce areas to address current and future challenges to water supplies and adapt to climate change, ensuring the water quality for a specific uses;
- Support for decision makers to integrate alternative water resources supply technologies in their strategic plans for water resources management taking into consideration the relevant EU regulatory frameworks (e.g. water and marine related policies, climate change adaptation strategy, Fit for 55);
- Increased societal awareness, acceptance of and trust in of several alternative water supply resources for water use in various societal, environmental and economic contexts;
- Increased market potential of alternative water resources.

Scope: The search for affordable, acceptable and reliable solutions is today a common challenge for water supply planners. A changing climate and increasing water scarcity, population growth, urbanisation and intensifying economic activities have put a strain on traditional water resources, which typically rely on available surface and groundwater resources. Ensuring the availability and sustainability of both surface and groundwater is a key element of the new EU strategy on adaptation to climate change.

According to a recent report on the drivers of and pressures arising from selected key water management challenges (EEA, 2021), water abstraction for public water supply, agriculture and industry is the main significant cause of failure to achieve good quantitative status. Over abstraction of surface water bodies can alter freshwater ecosystems and have adverse ecological effects, including decline of biodiversity. In addition, the over abstraction of groundwater bodies can lower groundwater levels with further impacts on groundwater-dependent aquatic ecosystems and cause salinisation of coastal aquifers, making them unusable for drinking water supply.

To address these problems and in order to improve the security of water supply, alternative water resources, such as rainwater harvesting, storm water, water reuse and reclamation, brackish and sea water desalination, aquifer recharge, are increasingly being used by water managers in rural, coastal and urban areas. However, in many case, the implementation of

several alternative water resources is not sustainable and not embedded in a strategic integrated water management plan at river basin or regional scale. In many cases the negative environmental impacts and associated infrastructure maintenance and investments costs are not properly assessed, nor the costs associated with meeting the EU water policy related requirements (i.e. WFD requirements). Finally, the public/social acceptance of several alternative water resources is lacking and this prevent their further implementation and market uptake. Further research and innovation is needed for making full use of alternative water resources.

Additionally, assessments and recommendations of how alternative water supply sources and infrastructures can relate to existing - mostly centralized - water utility regimes remain unexplored and there is a need to explore how the regulations around these centralized regimes can support infrastructure diversification.

The objective of this action is to improve the sustainability of various alternative water supply resources in the context of climate change and water scarcity adaptation. To achieve this objective the following issues should be addressed:

- Improve the efficiency, reliability and cost-effectiveness and sustainable design of a wide range of alternative water solutions (e.g., rainwater harvesting, storm water, water reclamation and reuse , brackish and sea water desalination, aquifer recharge).
- Assess the interaction between choices of the various alternative water supply technologies with the infrastructure design and development, the scale of operation and the water-energy interactions.
- Assess various alternative water solutions with regards to their potential their innovation, climate mitigation and adaptation and their environmental and health impacts. Explore the potential of digital technologies for appropriate data collection and integration. Attention should be given to reducing the negative impacts of infrastructures to increase water supply in water-scarce areas as well as reducing water demand (rebound effect).
- Develop a comprehensive framework or guidance tool for selecting specific technologies and management strategies for different water scarcity situations that can be adapted on a case-by-case basis and with a view of developing large-scale deployment strategies, in line with the requirements of the Water Framework Directive.
- Assess the critical factors that hinder the public acceptance of alternative water resources and identify measures and actions (e.g., policy actions, marketing interventions) to encourage their acceptance.

The possible participation of the JRC in the selected project would ensure that the approach proposed can be integrated as a scenario in the tool used by the European Commission for the estimation of water availability.

This action should bring together relevant researchers, technology providers, water utilities, business representatives, investors, policy makers and other water users and citizens. The

active participation and engagement of different stakeholders should span the entire project development and implementation to ensure performance and sustainability and maximise the final impact.

Proposals should cover various regions with a balanced coverage reflecting the various biogeographical and climate zones in Europe in a representative way.

The inclusion of relevant SSH expertise would be also needed to ensure the proposed solutions are also socially accepted.

HORIZON-CL6-2023-CLIMATE-01-3: Ocean and coastal waters carbon- and biodiversity-rich ecosystems and habitats in Europe and the Polar Regions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 2-4 by the end of the project (Option B) – see General Annex B. Activities are expected to achieve TRL 3-5 by the end of the project (Option A) – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio covering the topic, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within each of the two options (A or B) set under ‘scope’ , provided that the proposals attain all thresholds.
<i>Legal and financial set-up of the Grant</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the

<i>Agreements</i>	Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁵³ .
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Expected Outcome: In line with the European Green Deal and, in particular with the objectives of the European Climate Law³⁵⁴, the EU climate adaptation and mitigation strategies, the EU biodiversity strategy for 2030, the EU proposal for a nature restoration law³⁵⁵, the Marine Strategy Framework Directive (MSFD), the Birds and Habitats Directives, the Regulation (EU) n. 734/2008 on the protection of vulnerable marine ecosystems in the high seas from the adverse impacts of bottom fishing gears, successful proposals should further the European efforts in achieving climate-neutrality by maintaining and enhancing natural carbon sinks and stocks in marine and polar ecosystems, while preserving and enhancing their biodiversity, including by unfolding the potential of nature-based solutions, where adaptations to climate change are also being fostered for enhanced resilience.

Successful proposals are expected to contribute to all of the following expected outcomes:

- Better understood and enhanced mitigation potential of ecosystems, based on sustainable management of natural resources and climate change mitigation fostered through the maintenance and enhancement of natural carbon sinks and stocks, while preserving or enhancing biodiversity in ecosystems, in support of a sustained European leadership in ocean–climate–biodiversity nexus science;
- Advanced understanding and science in support of adaptation and resilience of natural and managed marine and polar ecosystems in the context of a changing climate, including its interaction with other natural or anthropogenic stressors such as pollutants, invasive species or marine construction, and better understood impacts of climate change on coastal zones (including the associated ecosystems) and improved adaptive capacity of ocean and marine systems, including by unlocking the potential of nature-based solutions;
- Uncovered mitigation opportunities of newly emerging European and polar blue carbon habitats (novel habitats emerging due to the rising atmospheric CO₂ that is intensifying climate change but also driving global and particularly polar greening; polar blue carbon increases with losses of marine ice (sea ice, ice shelf and glacier retreat) that generates a valuable negative feedback on (mitigating) climate change);

³⁵³ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

³⁵⁴ Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119>.

³⁵⁵ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

- Reduced knowledge gaps for enabling the inclusion of carbon- and biodiversity-rich marine habitats and accounting in nationally determined contributions (NDCs) and associated national climate plans and strategies (NAPs), such as additional national data collection, science and technical capacity, as well as significant contributions made to the implementation of the European Green Deal, particularly the climate and biodiversity objectives, the UNFCCC Ocean and Climate Change Dialogue, the Global Biodiversity Framework, and global scientific assessments.

Scope: The ocean and coastal ecosystems and habitats play a significant role in the global carbon cycle, representing the largest long-term carbon sink. Over the past decade, research efforts to understand the ocean and blue carbon sinks and utilize their potential in climate mitigation frameworks has increased. There are remaining research gaps for advancing opportunities to incorporate potential ocean and blue carbon ecosystems into climate frameworks. Evaluating and quantifying the broad range of benefits provided by coastal and marine ecosystems should strengthen the ability to account for them in nationally determined contributions (NDCs) and national adaptation plans (NAPs). Avoiding and reversing the loss and degradation and restoring carbon- and species-rich ecosystems in the ocean and coastal waters is highly effective and of highest importance for combined biodiversity protection and climate change mitigation actions with large adaptation co-benefits. If degraded or lost, these ecosystems are likely to release most of their carbon back into the atmosphere.

Actions should aim at developing innovative approaches to address only one of the following options:

- **Option A:** European and polar blue carbon hotspots and priority areas for climate policy frameworks and effective management (TRL 3-5)

The research actions should map European and polar blue carbon hotspots and priority areas for carbon sequestration and climate change mitigation potential, including an estimate of the area/extent of the habitats. In doing so, the successful proposal should rely on the synergistic use of Earth Observation data (in-situ, airborne, satellite) and models to monitor, evaluate and quantify both carbon fluxes and carbon stocks and stock changes in ocean and coastal reservoirs, to evaluate current trends and improve modelling skills and predictions, including using space and in-situ existing datasets and climate records that can be used as proxy (e.g., Copernicus, EMODnet).

The action should also gather information on organic carbon stocks and accumulation, their characteristics (source, lability, dissolved particulate, living, non-living), and their potential change under pressures from human activities. The action should identify the key characteristics that make the selected ecosystem and habitat a hotspot for blue carbon (i.e. geomorphology, physical-chemical characteristics, anthropogenic manipulation, sea level rise effects, etc.). The action should enable a better understanding of the dynamics of carbon between these reservoirs and the associated timescales involved. A quantification of the approximate amount of carbon (and preferably nutrients) fixed annually by those natural ecosystems in Europe, as well as a quantification of the annual degradation rates of the

ecosystems and consequent reduction in carbon sequestration should also be carried out. This knowledge should then be consolidated into a framework for predictive tools to investigate climate-smart management scenarios at appropriate scales, as well as methodologies, methods, and guidance tailored to the specific EU maritime region. The research action will identify and recommend best suited, fit-for-purpose, climate smart and resilient initiatives and activities that are relevant to local communities in order to protect, sustainably manage, restore, and enhance blue carbon habitats. Particular attention should be given to win-win-win solutions and strategies that have multiple benefits for climate mitigation and adaptation, biodiversity gains and benefit to people, including nature-based solutions, ecosystem-based approaches and technological-ecological synergies (TES) (combining technological and nature-based solutions). Where applicable and desirable, socioeconomic aspect of sustainability should also be part of such solutions, in order to make the projects more socially acceptable; e.g. allowing for eco-tourism, recreational activities and/or extraction activities (for example recreational fishing with permits or mussels farming that does not require any feed inputs) could also allow symbiosis with the communities in the coastal areas in which these ecosystems are situated. Where appropriate, this should include technological-ecological synergies (TES) as an integrated systems approach that recognizes the potential co-benefits that exist in combining technological and nature-based solutions. The action should also assess the synergies and trade-offs of combining nature-based solutions and blue infrastructure with grey infrastructure (i.e. hybrid measures), assess the scalability of nature-based solutions and whether the same benefits and effects achieved on a small scale can be achieved by implementing them across larger spatial scales. Actions should keep in mind and address the challenge that several factors may limit the effectiveness of nature-based solutions applied to coastal areas, making the case for more effective long-term strategies and activities (lack of knowledge of the benefits and limitations of nature-based solutions options, poor planning of measures, impacts of extreme weather- and climate-related hazards, emission of CH₄ and N₂O, and biogenic calcification, risks of slow-onset events, such as increasing temperature and biodiversity loss, and their interaction with multiple drivers (e.g., land use change) and cascading tipping points related to ecosystem degradation). Many of the approaches are conceptually feasible or have been demonstrated in the laboratory, but their consequences for the ocean, including on its biodiversity are uncertain, especially if applied at scale. Any proposed solutions should have to keep the precautionary approach in mind and demonstrate that they are biodiversity positive and have no negative impacts on the marine environment and ecosystem functioning. Particular attention should be given to maladaptation solutions. For each proposed solution, the action should identify the status, costs, potentials, risk & impacts (including tipping points and irreversibility, as well as the challenges posed by the emissions of blue methane, sea level rise, underwater permafrost thaw, coastal nitrate enrichment, etc.), co-benefits, trade-offs and spill over effects, and role in mitigation pathways. In addition, the economic feasibility should be taken into account, as well as the cost/benefit ratio of natural regeneration (rewilding) vs. assisted (e.g., *Posidonia* beds restoration/protection against trawling) vs. full restoration.

The action should identify and quantify the impact of anthropogenically induced activities that lead to the disturbance, degradation and destruction of these habitats (with estimation of

the most and least impactful activities, CO₂ release in the atmosphere and the cost of no action) (direct or indirect pressure from human activities, such as bottom-contact fisheries, and climate forcing).

Finally, the action should make policy recommendations for advancing the incorporation of potential blue carbon ecosystems into climate frameworks, transforming science into effective policy and management and significantly contribute to the implementation of the European Green Deal and its climate and biodiversity strategies and objectives, including the Communication on Sustainable Carbon Cycles and the EU proposal for a nature restoration law³⁵⁶ which includes targets.

- **Option B:** Uncover mitigation opportunities of newly emerging European and polar blue carbon habitats (TRL 2-4)

Rising atmospheric CO₂ is intensifying climate change but it is also driving global and particularly polar greening. Polar blue carbon increases with losses of marine ice over high latitude continental shelf areas. Marine ice (sea ice, ice shelf and glacier retreat) losses generate a valuable negative feedback on (mitigating) climate change. The research action should conduct exploratory research into potentially new habitats emerging that could yield both mitigation and biodiversity benefits, if appropriately managed. Among the emerging habitats that should be tested in terms of their emerging role in carbon storage and sequestration, with the aim of understanding of carbon sink balances and climate change–feedback variability and reduce uncertainty in model projections, are: blue carbon change with sea ice losses; blue carbon gains from glacier retreat along fjords (fjordic blue carbon, i.e. seabed biological carbon gains as a result of recent rapid glacier retreat along fjords); blue carbon gains from ice shelf losses through opening up of productive new habitat and leaving nutrient-fertilized wakes of enhanced productivity; slight increases in sea temperature may also increase polar blue carbon; blue carbon around Antarctica is increasing with climate change, and the productivity within emerging fjords is likely to further increase with age and seasonal sea ice loss; snow and ice retreat in the subarctic and subantarctic; marine ice losses that create new polar continental shelf habitat across millions of km² and doubling seabed carbon stocks in 25 years; fjords that have become exposed by glacier retreat (fjords are hotspots for the burial and storage of organic carbon and for their potential to provide an important long-term global climate regulation service); massive coastal embayment emerging as a result of giant iceberg breakout from ice shelves; new and intense phytoplankton blooms around the Southern Ocean which have doubled carbon storage by seafloor organisms in the last 25 years; marine ice loss in the Arctic; macroalgal particulate organic carbon sinks; changes in primary production in open Arctic waters; loss of pagophilic (ice-dependent) species and lower albedo, macroalgae, bivalves; species yet to be discovered in polar and deep-ocean ecosystems; relatively inaccessible habitats; novel approaches to secure carbon stocks in the face of fishing disruption (e.g., through changes in target species, gear, target areas). The action should build on existing and novel datasets (in-situ and satellite) to gather

³⁵⁶ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

carbon information on stocks and accumulation, carbon characteristics (source, lability), change under pressures from human activities if not protected, the potential for carbon sequestration and associated timescales, understanding of carbon dynamics, framework and criteria to integrate these considerations and predictive tools to investigate management scenarios at appropriate scales, including displacement and trade-offs. The action should identify the key characteristics that led to the selected ecosystem and habitat to be considered a hotspot for blue carbon (i.e. geomorphology, physical-chemical characteristics, anthropogenic manipulation, sea level rise effects, etc.).

The action should also identify and recommend best suited, fit-for-purpose, climate smart and resilient and locally informed actions, initiatives and activities to protect, sustainably manage, restore, and enhance these newly emerging European and polar blue carbon habitats and assess the impact of anthropogenically induced activities that lead to the disturbance, degradation and destruction of these habitats and assess the synergies and trade-offs of protection vs. no action.

For **both options (A & B)**, international cooperation is strongly encouraged, with a strong linkage with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with the other project funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe, and the EU Polar Cluster. Actions should build upon and link with Horizon projects (in particular project funded under the calls HORIZON-CL6-2022-CLIMATE-01-02: Understanding the oceanic carbon cycle, HORIZON-CL6-2021-BIODIV-01-03: Understanding and valuing coastal and marine biodiversity and ecosystems services, HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems, HORIZON-CL6-2021-CIRCBIO-01-09: Unlocking the potential of algae for a thriving European blue bioeconomy, HORIZON-MISS-2021-OCEAN-02-01: European Blue Parks, HORIZON-MISS-2022-OCEAN-01-07: Integration of biodiversity monitoring data into the Digital Twin Ocean, EU PolarNET2), the Copernicus marine service, Sustaining Arctic Observing Networks (SAON), Scientific Committee on Antarctic Research (SCAR) and Southern Ocean Observing System (SOOS), and international Ocean Observing Initiatives. The R&I needs to be conducted in a multidisciplinary and ecosystem-based approach.

This topic is part of a coordination initiative between the European Space Agency and the European Commission on Earth System Science. Under the initiative, both institutions aim at coordinating efforts to support complementarities between the Horizon Europe and the European Space Agency FutureEO programmes, and their projects. Proposals under this topic should address networking and collaborative research activities with relevant European Space Agency actions. In particular, the European Space Agency will contribute to this topic with existing and planned projects focused on enhancing the observation capacity and understanding from satellite EO technology of carbon sinks and stocks in marine and polar

ecosystems³⁵⁷. Relevant European Space Agency activities will be implemented under the A) Ocean Science Clusters (eo4society.esa.int/communities/scientists/esa-ocean-science-cluster), B) the Biodiversity Science Clusters (eo4society.esa.int/) and C) the Polar Science Cluster (eo4society.esa.int/communities/scientists/esa-polar-science-cluster). Proposals should address the collaboration with ongoing or future European Space Agency projects, including those that will be funded through dedicated coordinated invitations to tender, and should towards this end include sufficient means and resources for effective coordination. Applicants are encouraged to contact the European Space Agency to organise the joint European Commission - European Space Agency work. Collaboration with the relevant existing European Research Infrastructures is encouraged.

All in-situ data collected through actions funded from this call should follow INSPIRE principles and be available through open access repositories supported by the European Commission (Copernicus, GEOSS, and EMODnet).

Synergies and complementarities with projects funded under topics: HORIZON-CL5-2024-D1-01-07: Quantification of the role of key terrestrial ecosystems on the carbon cycle and related climate effects; HORIZON-CL5-2023-D1-02-02: EU-China international cooperation on blue carbon; Mission Restore our Ocean and Waters by 2030 (HORIZON-MISS-2021-OCEAN-02-01: European Blue Parks, HORIZON-MISS-2021-OCEAN-02-03: Atlantic and Arctic basin lighthouse - restoration of marine and coastal ecosystems and increased climate resilience, HORIZON-MISS-2022-OCEAN-01-01: European Blue Parks – Protection and restoration solutions for degraded coastal and marine habitats, HORIZON-MISS-2022-OCEANCLIMA-01-01: Mission Climate adaptation and Mission Ocean and waters - Joint demonstration for coastal resilience in the Arctic and Atlantic sea basin).

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CLIMATE-01-4: Demonstration network on climate-smart farming – linking research stations

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 20.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 20.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility</i>	The conditions are described in General Annex B. The following

³⁵⁷ Dedicated ESA invitation to tenders to be launched in 2023 and 2024 for each of the clusters will be published in the ESA-STAR Tender publication system (<https://esastar-publication-ext.sso.esa.int>).

<i>conditions</i>	exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
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Expected Outcome: Project results are expected to contribute to all of the following expected outcomes:

- The knowledge base of climate-related farming practices is expanded, resulting in increased application of climate-neutral approaches;
- Different methods of climate-smart agriculture in plant and animal production are assessed and evaluated with all relevant actors involved; with all relevant actors involved;
- The involvement of and adoption by farmers of innovative / smart farming practices that mitigate emissions of greenhouse gases (GHGs) and that foster adaptation of the sector to climate change is accelerated. In the long-term, this will support a more substantial contribution of the farming sector to mitigation of GHG emissions and to carbon storage;
- Implementation of the EU carbon farming initiative, as presented in the communication on “Sustainable Carbon Cycles”³⁵⁸ is supported;
- The involvement of Member States’ and Associated Countries’ agricultural knowledge and innovation systems (AKIS) in climate-related farming issues is increased, including through linking to national, regional and local projects under the European Innovation Partnership "Agricultural productivity and sustainability" (EIP-AGRI) and to research stations, with a view to wider dissemination and enhanced interaction within and across the Member States and Associated Countries.

Scope: The conservation and enhancement of Earth’s natural terrestrial carbon sinks such as soils and plants, forests, farmed lands and wetlands is crucial. The European Green Deal gives research and innovation (R&I) a significant role to play in supporting the design and implementation of policies that will ensure the achievement of the EU’s climate objectives. Project implementation is expected to contribute to mitigation of and adaptation to climate change and help achieve climate-neutrality.

A wide adoption of practices contributing to mitigation of climate change and enhanced carbon storage by farmers is a priority to ensure that the EU reaches GHG mitigation objectives by 2030 and climate-neutrality for land use by 2035 and for the overall economy by 2050. Farming is also vulnerable to impacts of climate change; hence adaptation is of utmost importance. Mainstreaming the use of climate-smart practices has been recognised as a priority at the global level, including by the G-20.

³⁵⁸ COM(2021) 800, 15.12.2021, https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles_en

The overall aim is to establish a three-level network in a phased manner over Cluster 6 work programmes 2021/2022 and 2023/2024. The first level is a network which engages front-runner farmers introducing on-farm trials and demonstration of innovations, using existing knowledge both in the EU and in Associated Countries (project “Climate Farm Demo”). The second level is a network to connect to all advisors on the subject in the Member States, building on achievements of Horizon 2020 projects and EIP-AGRI operational groups and the development of Member States’ AKIS, to ensure the provision of targeted advice. The third level of the network – the present topic – will engage and strengthen the capacity of experimental research stations on climate issues.

Proposals should:

- Network existing research stations involved in adaptation to or mitigation of climate change in agriculture, to create an EU network including all Member States and where possible Associated Countries and to stimulate effective cross-fertilisation among them;
- Exploit existing solutions and develop new ones through practice-oriented on-farm testing and demonstration in a co-creative approach with pilot farmers and their advisors;
- Collect and compare tool-kits for assessing GHG balances at farm level, monitoring of performance in reducing emission, decision-support tools, climate services, etc. for possible use also on average farms;
- Explore carbon farming techniques (as defined in the Communication on “Sustainable Carbon Cycles”) and their outcomes, also in terms of better farm management; analyse costs of carbon farming management practices and revenue possibilities as well as related risk and challenges; develop and/or test monitoring, reporting and verification systems; facilitate knowledge exchange and support tailored training and advisory services;
- Foster knowledge exchange within and among Member States and regions and establish links with the EIP-AGRI and Member States’ AKIS networks and coordination bodies;
- Include a task to collaborate with the project “Climate Farm Demo” funded under topic HORIZON-CL6-2021-CLIMATE-01-04 and with the project funded under topic HORIZON-CL6-2022-CLIMATE-01-03 “Demonstration network on climate-smart farming – boosting the role of advisory services”.

The project should operate for at least five years and build on the outcomes of the climate-related projects from various funding sources. The project must implement the multi-actor approach and may involve social innovation.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-CLIMATE-01-5: Pilot network of climate-positive organic farms

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁵⁹ .

Expected Outcome: This topic should contribute to mitigation of and adaptation to climate change and help achieve climate-neutrality by 2035 (in the land-use sector) and 2050 (across the EU economy). It will also contribute to meeting the target of the farm to fork strategy of having 25% of the EU’s agricultural land under organic farming by 2030, as well as to implementing concrete actions of the action plan for the development of organic production³⁶⁰.

Project results are expected to contribute to all of the following expected outcomes:

- The capacity of organic holdings to mitigate and adapt to climate change is enhanced, with co-benefits for biodiversity, water, soil and air;

³⁵⁹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

³⁶⁰ COM(2021) 141, 10.4.2021, https://agriculture.ec.europa.eu/farming/organic-farming/organic-action-plan_en

- Qualitative and quantitative data on the climate-related and other (co-)benefits and impacts of organic production are made more easily accessible, contributing to building the knowledge base for EU policy design and implementation and to increasing consumer awareness of the benefits of organic production;
- Carbon farming practices (as described in the Communication on “Sustainable Carbon Cycles”³⁶¹) are further developed in the organic farming sector;
- Agricultural knowledge and innovation systems (AKIS) and decision-support systems in the organic sector are strengthened, in particular with regard to climate adaptation and mitigation.

Scope: The conservation and enhancement of Earth’s natural terrestrial carbon sinks such as soils and plants, forests, farmed lands and wetlands is crucial. The European Green Deal gives research and innovation (R&I) a significant role to play in supporting the design and implementation of policies that will ensure the achievement of the EU’s climate objectives. Organic farming relies on management practices that contribute to climate change mitigation, with additional benefits for the environment and biodiversity. The organic sector also has a role to play in the implementation of the EU carbon farming initiative as developed in the 2021 Communication on “Sustainable Carbon Cycles”.

Proposals should:

- Establish a pilot network of existing and newly converted commercial certified organic farms and research stations representative of the main organic farming production systems (both plant and animal production) and regions in the EU.
- Provide for the collection at farm and landscape level of data relevant to organic farming and to climate change and other environmental objectives;
- Implement carbon farming techniques and analyse their outcomes, also in terms of better farm management; analyse costs of carbon farming management practices and revenue possibilities as well as related risk and challenges; develop and/or test monitoring, reporting and verification systems;
- Enhance sharing of knowledge and best practice on adaptation to and mitigation of climate change in the organic sector, including with regard to carbon farming, with attention also to regions where the organic sector is less developed, and support tailored training and advisory services;
- Ensure that project outcomes are made available also beyond the organic farming sector, including to other farmers who focus on low-input farming, circular agriculture and agroecology;

³⁶¹ COM(2021) 800, 15.12.2021, https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles_en

- Establish links with projects under the topics on a demonstration network for climate-smart farming (HORIZON-CL6-2021-CLIMATE-01-04 – project “Climate Farm Demo”, and HORIZON-CL6-2022-CLIMATE-01-03), on agroecological approaches for climate change mitigation, resilient agricultural production and enhanced biodiversity (HORIZON-CL6-2021-CLIMATE-01-05), and on improving yields in organic cropping systems (HORIZON-CL6-2023-FARM2FORK-01-3), as well as with the planned partnership on agro-ecology living labs and the Mission “A Soil Deal for Europe”.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2023-CLIMATE-01-6: Analysing fossil-energy dependence in agriculture to increase resilience against input price fluctuations

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁶² .

Expected Outcome: In supporting the implementation of the European Green Deal, in particular the European Climate Law, the farm to fork strategy and the common agricultural policy, R&I is expected to support agriculture pathways towards reduced greenhouse gas emissions and better use of inputs, while improving the incomes of primary producers.

³⁶² This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Relevant inputs include in particular fossil fuels and fertilisers produced from non-renewable resources. The topic will contribute to the Destination's expected impact of "foster[ing] climate change mitigation in the primary sectors, including by the reduction of their GHG emissions and other pollutants".

Successful proposals are expected to contribute to all of the following expected outcomes:

- Better analytical tools and capacity to integrate the use of fossil energy and energy-intensive inputs in modelling and in socio-economic analysis more broadly;
- Improved decision-making by farmers in relation to the consumption of energy and energy-intensive inputs, in particular mineral fertilisers;
- Better capacity of the farming sector to cope with variations in the price of energy and energy-intensive inputs;
- Direct and indirect dependence of the sector on hydrocarbons is reduced.

Scope: Proposals should:

- Use foresight methods to elaborate scenarios of fossil energy and mineral fertiliser use evolution and dependence. Where available, reference scenarios of the European Commission (DG ENER) should be used to advance the state of the art;
- Improve the capacity of models to take into account direct and indirect energy uses and prices;
- Cover both macro and micro levels in the analysis. At the micro-economic level linkages should be established with the Farm Sustainability Data Network (FSDN) under development by the European Commission;
- Develop tools to support farmers' decision-making for optimal use of energy and mineral fertiliser, to improve economic, environmental and climate performance of farming systems.

This topic should involve the effective contribution of SSH disciplines.

Projects shall leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud, as well as data from relevant Data Spaces in the data-driven analyses.

The possible participation of the JRC in the project would ensure that the approach proposed is compatible with and improves the tools used at the European Commission.

HORIZON-CL6-2023-CLIMATE-01-7: Enhancing the sustainable production of renewable energy at farm-level

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: This topic supports the implementation of the EU bioeconomy strategy by creating opportunities for new cooperation in production, sales and distribution of renewable energy, which can provide agricultural communities (conventional and organic sectors) with an extra source of income, while contributing to clean energy supply for society without harming the environment.

Project results are expected to contribute to all of the following outcomes:

- Development of sustainable solutions and business models to reduce greenhouse gas emissions by at least 55% by 2030 in the EU and ultimately achieve net-zero greenhouse gas emissions by 2050.
- Identification of technical, economic, societal, environmental and regulatory barriers hampering further scale-up of renewable energy at farm-level
- Development of suitable and sustainable solutions to produce co-benefits (e.g. energy production, higher productivity, less water use, further pollination) and increase their up-take in practice.
- Recommendations for improved and targeted guidance, incentives and policies at regional, national and EU-level to reduce environmental impacts and financial risks for farmers.
- Diversification and enhancement of agricultural incomes (organic and conventional farming).

Scope: Many different forms of renewable energy are produced in rural areas, ranging from wind, solar (including agri-voltaics) and geothermal sources to different forms of bioenergy. Between these renewable energy sources and the environment, there can be trade-offs (e.g. land use change, biodiversity loss, air pollution) but also synergies. Small and medium scale installations can provide opportunities for new cooperation in production, sales and distribution of renewable energy, and thus, can provide agricultural communities

(conventional and organic sectors) with an extra source of income, while contributing to clean energy supply for society. If well planned and implemented, such installations can be deployed without harming the environment, or even with positive impacts, for example preserving soils quality, contributing to water retention, avoiding methane emissions or supporting pollination.

However, the variety of options also result in complex considerations, as the potential, performance and impacts of renewable energy technologies depend on natural conditions, size and type of farm, approaches designed and implemented, management techniques, degree of mechanization, geographic location, and socio-economic factors, such as awareness ,about technologies and their implementation, investment and advice support for farmers, as well as the surrounding energy system and energy infrastructure.

Proposals will:

- Analyse the different options to deploy renewable energy installations on farms, thereby assessing their environmental impacts (on climate change, biodiversity loss, pollution and natural resources depletion) and identifying the best options to mitigate trade-offs and supporting synergies in light of the sustainable management of agricultural land coupled with production of food and feed.
- Assess the opportunities for and barriers (e.g., financial risks and incentives/policies to overcome them) to combine agricultural production and different sustainable renewable energy technologies.
- Engage with relevant stakeholders and develop innovative business models for farmers producing sustainable renewable energy, including self-consumption, energy communities or direct feed into the electricity or gas grid or collective sales approaches that could potentially enhance profitability for farms.
- Analyse the potential of smart energy systems in rural areas and consider economically viable energy storage and transformation solutions for combined production of biogas/ biomethane, solar and wind as well as smart battery and energy solutions, including power to gas (hydrogen), thermal energy storage for self-use and grid stabilisation.
- Address the nutrient recovery and minimisation of negative environmental impacts, or even co-benefits, in the context of good agricultural practices and possible sanitary implications.
- Promote bioeconomy-related interventions in the new CAP and provide advice and technical guidance for Member States.

Proposals are expected to cooperate with other relevant EU-funded research projects, in particular ongoing projects under Cluster 5 of Horizon Europe.

Proposals must apply the concept of the 'multi-actor approach' and ensure adequate involvement of the farming sector, and actors active in rural areas.

HORIZON-CL6-2023-CLIMATE-01-8: Closing the research gaps on Essential Ocean Variables (EOVs) in support of global assessments

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR 5.00 and 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 17.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5-6 by the end of the project (Option C) – see General Annex B. Activities are expected to achieve TRL 7-8 by the end of the project (Option B) – see General Annex B. Activities are expected to achieve TRL 7-8 by the end of the project (Option A) – see General Annex B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: To ensure a balanced portfolio covering the Essential Ocean Variables (EOVs), grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within each of the three options (A, B or C) set under “scope”, provided that the applications attain all thresholds.

Expected Outcome: In line with the European Green Deal and, in particular with the objectives of the European Climate Law, the EU climate adaptation and mitigation strategies, the EU biodiversity strategy for 2030, the EU proposal for a nature restoration law³⁶³, the Marine Strategy Framework Directive (MSFD), successful proposals should further the European efforts in achieving climate–neutrality by advancing the understanding and science to support adaptation and resilience of natural and managed ecosystems in the context of a

³⁶³ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

changing climate and biodiversity loss and by efficiently monitoring, assessment and projections related to climate change impacts, mitigation, and adaptation potential to deliver solutions for tackling emerging threats and support decision-making at regional, European and global levels.

Successful proposal results are expected to contribute to all of the following expected outcomes:

- Further developed key ocean monitoring indicators, Essential Climate Variables (ECVs from GCOS), Essential Ocean Variables (EOVs from GOOS) in compliance with international programmes (IPCC, WOA, IPBES, CMIP, CLIVAR, Ocean Health Index, UN Decade, ARGO) that support international global assessments and foster the development of a regional approach to ocean climate monitoring and reporting, overcoming current limitations and gaps;
- Further improved Earth System Models (ESMs) representing key physical, biogeochemical and biological processes in the ocean with reduced uncertainty of climate change projections at regional scales, and reduced biases (i.e. in the WCRP Coupled Model Intercomparison Project (CMIP7) models for ocean and polar regions);
- Better understood links between ocean physical, biogeochemical and biodiversity (including microbes and macro-organisms) variability over time, and the impacts of environmental stressors (e.g., warming, extreme events, ocean deoxygenation, and acidification) on ocean health, GHG sources and sinks, biology and ecosystems, as well as advanced understanding and science in support of adaptation and resilience of natural and managed marine and polar ecosystems in the context of a changing climate, including its interaction with other natural or anthropogenic stressors like pollutants;
- Strengthened development of common, agreed standards for climate records content, format, quality and validation methodology;
- Enabled evidence-based decision-making (e.g., developing early warning ocean climate indicators); Sustained European leadership in ocean-climate-biodiversity science nexus supporting EU programmes e.g., the Copernicus climate service, marine service, EEA / JRC reporting and complementing other relevant European programmes (e.g., science programme of the European Space Agency); Significant contribution to the implementation of the European Green Deal and its climate and biodiversity objectives, the EU maritime strategy, to the development of the European Digital Twin of the Ocean³⁶⁴ (both data and models components), and to global scientific assessments, such as the IPCC, IPBES and WOA, as well as to the UNFCCC Ocean and Climate Change Dialogue, UN Decade of Ocean Science and UN SDGs 13 and 14.

Scope: To be able to deliver ocean forecasts and early warnings, climate projections and assessments and protect ocean health and its benefits, it is vital to measure Essential Ocean

³⁶⁴ [European Digital Twin of the Ocean \(European DTO\) | European Commission \(europa.eu\)](https://ec.europa.eu/digital-twin/ocean/).

Variables (EOVs). The Essential Climate Variables and Essential Ocean Variables form the basis of the Global Climate Indicators that contain key information for the most relevant areas of climate change. The physics, chemistry, biology and biodiversity (including microbes and macro-organisms) of the ocean system are irrevocably interlinked. Ocean ecosystems are subject to a multitude of stressors, including changes in ocean physics and biogeochemistry, and direct anthropogenic influences. Implementation of protective and adaptive measures for ocean ecosystems sustainable management and conservation requires a combination of ocean observations with analysis and prediction tools that can guide assessments of the current state of ocean ecosystems, elucidate ongoing trends and shifts, anticipate impacts of climate change and management policies and provide decision makers and the public with the necessary information to assess the impact of policy decisions. In physical oceanography, essential variables have been collected globally in a standardized manner providing valuable input to the IPCC. Expansion of biogeochemical and ecological observation systems should allow for significant advances in the development and application of analysis and prediction tools for ocean biogeochemistry and ecosystems, production of biodiversity essential variables and associated climate records, with multiple societal benefits. This requires further standardisation and improved utilisation of existing sensors, as well as exploration and development of new sensor technology, suitable for ships, mooring and autonomous platforms, increased use of emerging remote sensing technologies at higher resolution.

One of the major roles of the research conducted under this topic should be to deliver [integrated multidisciplinary ocean science](#) by means of the physical, biogeochemical and biological/ecosystem research communities coming together and joining forces for development of Essential Ocean Variables, integration of observations from the different oceanographic disciplines into models for multidisciplinary analysis and reporting.

Actions should aim at developing innovative approaches to address only one following options:

- **Option A:** Improving the monitoring, understanding, reporting (Essential Variables) and projections of essential **physical** oceanic processes related to climate and changes over time, and production of related Essential Ocean Variables and indicators, at regional or sea basin scale (sea state, ocean surface stress, sea ice, ocean surface heat fluxes, sea surface and subsurface salinity, sea surface height, sea surface and subsurface temperature, ocean circulation and surface and subsurface currents, ocean layering and density gradient, upwelling) (including GHG fluxes) (TRL 7-8).

The research action is expected to further develop essential physical ocean monitoring indicators, EOVs, ECVs, improve their performances (e.g. resolution, uncertainties) and support their integration in climate models in order to improve the understanding of important feedbacks (e.g., cryosphere–ocean interactions such as: permafrost thawing–ocean feedbacks, ocean–ice sheet coupling, wind– and wave–ice coupling and sea ice formation, carbon–climate feedbacks). The activity should improve monitoring and reporting in specific ocean areas such as at depth and in marginal areas, over the continental shelf slopes, coastal zones and polar areas. The action should combine observation analyses and models over different

time scales (by making use of instrumental and proxy data), benefiting from latest advances in satellite measurements and in-situ, to improve the scientific understanding of the change and variability of ocean circulation and ocean heat content change, sea surface and subsurface conditions (temperature, salinity, sea ice, currents, deep convection), and the short- and long-term variability, as well as improve projections at regional scales.

The action should advance the scientific understanding of the projected decrease of Antarctic ice and Arctic sea ice and contribute to improving model projections of future changes, particularly at the regional level; of the potential connections between Arctic polar warming and sea ice loss and mid-latitude atmospheric variability; and the understanding and sea level long term prediction better considering the response of the ice sheets on multi-decadal to centennial timescales.

The action should advance in improving the characterisation of ice sheets and glaciers contribution in sea level monitoring, and projections, and advance our understanding and prediction of the multi-decadal reversibility. The action should contribute to the development of a more quantitative understanding and predictability of the processes that cause and maintain ocean extremes, and the conditions that are conducive for the generation of extremes.

- **Option B:** Improving the monitoring, understanding, reporting (Essential Variables) and projections of essential **biogeochemical** oceanic processes related to climate and changes over time at regional or sea basin scale (oxygen, nutrients, inorganic carbon, transient tracers, nitrous oxide, ocean colour, particulate matter, dissolved organic carbon, elemental and isotopic tracers, stable carbon isotopes, marine debris) (TRL 7-8).

The action should further develop essential biogeochemical ocean monitoring indicators, EOVs and ocean ECVs. The action should support the development of the ocean component of climate models through a better representation of essential biogeochemical processes, microbe biomass and diversity and enable a better understanding of the links between ocean physical and biogeochemical variability. The action should combine GHG measurements in regions especially critical for GHG fluxes (the polar oceans, main open-ocean convection areas like the North Atlantic, southern hemisphere, coastal and marginal seas, or coastal upwelling zones) with relevant biogeochemical measurements (e.g., oxygen, nutrients, carbon) to support GHG data analyses and model simulations. The action should improve the understanding of ocean biogeochemical fluxes and turnover of carbon and nitrogen in the ocean using state of the art autonomous observation technology combined with remote-sensing. This includes quantifying fluxes between basins/regimes (e.g. Arctic to North Atlantic, or coastal to oceanic) and across boundaries (air-sea, water-sediment), as well as between chemical phases (such as inorganic to organic, particulate to dissolved). Focus should be on quantifying GHG reservoir size and change, and potential subsequent impact on GHG fluxes, ocean productivity, carbon sequestration, oxygen demand and carbonate system.

The action should further inform models and improve predictions of the Earth system response to ocean acidification and to the ocean biological pump, including the long-term trends in ocean chemistry, beyond the observational record (paleo-ocean acidification), for a

better understanding of the multi-decadal reversibility or the hysteresis of ocean processes (like the AMOC). Links should be made with ocean stratification that acts as barrier for water mixing or carbon sequestration.

The action should improve observations for the interplay between carbonate chemistry and a variety of biogeochemical and physical processes, including eutrophication and freshwater inflow and outflow in coastal zones, and increase the robustness of future assessments of ocean acidification. The action should improve our understanding of changes in water mass ventilation associated with climate change and variability to gain further insights into future trends in ocean acidification.

The action should further research the net response of natural ocean CH₄ and N₂O sources to future warming, including permafrost, and predict the magnitude and timing of the responses of each individual process.

The action should make use of the recent developments, such as the [Biogeochemical ARGO](#), to investigate extreme conditions, and extreme or compound events below the surface of the ocean, and their link to biogeochemical processes.

The action should further contribute towards the integration of more biogeochemical parameters, assimilation techniques, models and assessment strategies into ESMs.

- **Option C:** Improving the monitoring, understanding, reporting (Essential Variables) and projections of essential **biological and ecosystem** oceanic processes related to climate and changes over time at regional or sea basin scale (marine habitat properties, calcifying organisms, phytoplankton, zooplankton, fish, nekton migration, marine turtles, birds and mammals, hard coral, seagrass, mangrove, macroalgal canopy, microbe, invertebrate, ocean sound) (TRL 5-6).

The research action should further develop the essential biological and ecosystem ocean monitoring variables and indicators, and the development of early warning systems based on biological indicators (like marine calcifying organisms, coral reefs or plankton lifecycle).

The action should develop the integration (e.g., forcing, assimilation of boundary conditions, coupling, etc.) between climate models (physics and biogeochemistry) and ecosystem/marine habitat models to support ocean biodiversity variables and ECV development, in particular, quantifying the sensitivity of regional ecosystems responses to poorly-resolved, global, physical & biogeochemical inputs at model boundaries. The action should also identify & quantify the propagation of non-linear errors through the ecosystem models (from physics through biogeochemistry and to the highest trophic levels), including through better integration of numerical & statistical approaches allowing improved forecasting.

The action should further develop observation processing for biological and ecosystem EOVs and ECVs production, and assess needs for additional observations in support of biological EOVs and ECV development and validation. The action should support the development of common approaches and standards for the development of biological and ecosystem variables and ECVs for the oceans by strengthening the use of observation networks and relevant

biogeochemistry, biological and ecological measurements; an increase use of high-resolution remote sensing technologies, and the development of inter-calibrated protocols, notably for macroalgae, coral reefs, mangroves, tidal marshes, saltmarshes and seagrass. Particularly, it should extend the physical, biogeochemical, and ecological data records needed to develop, initialize, and validate marine ecosystem forecasts.

The action should assess the integration of the whole model chain (ESM + biology) on some specific test cases to evaluate uncertainties and potential use of such a modelling capacity for climate scenarios development and policy - management: e.g., evaluation of impacts of overshoot on ecosystems due to extreme climate change scenarios, perturbation of the biological carbon pump in a changing ocean or tipping point effect, surpassing the physiological tolerance limits beyond which the resilience of the ecosystem is compromised.

Particular attention should be paid to impacts of warming and acidity, or changes in the frequency and intensity of disturbance regimes, as they may lead to the collapse or transition of ecosystems to a new ecological state, with a loss or altered biodiversity and ecosystem services. The action should advance our scientific understanding of how extremes affect organisms and ecosystems, in particular for the effect of dual- or triple-compound events, by better understanding the cumulative effects on biota of the multifaceted characteristics—from abruptness to recurrence—associated with individual extremes; and the role of the compounding effect of the different hazards, leading to a complex matrix of often new conditions. Furthermore, advances should be made with regard to closing gaps in our understanding of the factors controlling biological, genetic and functional diversity, food-web interactions and relationships between different ecosystem constituents (trophic links, symbiosis, parasitism, etc.), and, also with regard to the physiological states and trophic modes (mixotrophy) of populations, before these models can be made operational in future forecasting and impact projection applications.

The action should establish protocols for the scientific validation of forecasts to validate results and build trust in forecasts, and ensure forecasts have the necessary spatiotemporal resolution for analysis and application to marine resource management, or to force downscaled regional forecasts.

The action should contribute towards the integration of more ecosystem parameters, assimilation techniques, models and assessment strategies into ESMs.

For **all three options (A, B & C)**, actions should result in better scientific understanding and quantification of tipping points and abrupt system changes, and associated impacts, including aspects of irreversibility and compound events. Actions should support a regional approach to ECVs, EOVs, ocean monitoring indicators and climate change / ocean health assessment, taking into account sea basin specificities. The action should result in spatially and temporally explicit information about physical, biological, and chemical properties of the ocean. Actions should also advance the understanding of the impacts caused by the crossing of tipping elements and develop early warning indicators. Where appropriate, the combination of multiple drivers and/or hazards that contribute to societal and/or environmental risk should be assessed. Actions should identify safe operating spaces for the ocean to provide life-support

systems for humanity, accompanied – where relevant – with long-term strategies for preventing or mitigating impacts. To better monitor significant changes in physical and biogeochemical environments and their impacts on ecosystems and society, actions should enable further integration of multidisciplinary observation systems (in-situ, airborne, satellite) and improved models. The assessments of cumulative effects should look at existing and past activities in the marine environment but should also allow for foresight in order to inform planning of future activities and support management that is adaptive to future conditions and sustains ecosystems and human well-being.

The actions funded under this topic should have a strong collaboration element and mechanism in order to ensure that the topic delivers on its key research priorities and help characterize the interplay and dependence between the biological, chemical, and physical properties of the ocean environment. The actions should build on existing observing platforms, Copernicus, and strengthen and expand the current capacities in a multidisciplinary and ecosystem-based approach. This multidisciplinary approach is key to comprehensively understand the variety of effects of global change on the ocean and its ecosystems. This topic provides for the opportunity to strengthen the interaction between biological and physical and biogeochemical platforms and research communities. To this end, proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with the other projects funded under this topic, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe. Relevant activities of the plan will be set out and carried out in close cooperation with relevant Commission services, ensuring coherence with related policy initiatives.

International cooperation will be essential in integrating and coordinating these different scaled approaches. A strong linkage should be ensured with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance, UN Decade of Ocean Science, and GOOS bio-eco panel. Actions under this topic will build upon and link with Horizon projects (COMFORT, PolarRES, CrIceS, EuroSea, AtlantOS, EPOC, OCEAN ICE, OceanICU, Jetzon, DOOS, etc.), the Copernicus marine service, GOOS, the Ocean Biogeographic Information System (OBIS), MBON of GEOBON, ICOS, GCOS, and other relevant international Ocean Observing Initiatives. All in-situ data collected through actions funded from this call should follow INSPIRE principles and be available through open access repositories supported by the European Commission (Copernicus, GEOSS, and EMODnet).

This topic is part of a coordination initiative between the European Space Agency and the European Commission on Earth System Science. Under the initiative, both institutions aim at coordinating efforts to support complementarities between the Horizon Europe and the European Space Agency FutureEO programmes, and their projects. Proposals under this topic should address networking and collaborative research activities with relevant European Space Agency actions. In particular, the European Space Agency will contribute to this topic with existing and planned projects focused on enhancing the observation capacity and

understanding from satellite EO technology of the relevant ocean processes³⁶⁵. Relevant European Space Agency activities will be implemented under the A) Ocean Science Clusters (eo4society.esa.int/communities/scientists/esa-ocean-science-cluster), B) the Biodiversity Science Clusters (eo4society.esa.int/) and C) the Polar Science Cluster (eo4society.esa.int/communities/scientists/esa-polar-science-cluster). Proposals should address the collaboration with ongoing or future ESA projects, including those that will be funded through dedicated coordinated invitations to tender, and should towards this end include sufficient means and resources for effective coordination. Applicants are encouraged to contact ESA to organise the joint European Commission-European Space Agency work.

Projects shall leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud, Copernicus, as well as data from relevant Data Spaces in the data-driven analyses. Projects could additionally benefit from access to infrastructure and relevant FAIR data by collaborating with projects funded under the topics HORIZON-INFRA-2022-EOSC-01-03: FAIR and open data sharing in support of healthy oceans, seas, coastal and inland waters and HORIZON-INFRA-2024-EOSC-01-01: FAIR and open data sharing in support of the mission adaptation to climate change.

Collaboration with the relevant existing European Research Infrastructures is encouraged.

Synergies and complementarities: HORIZON-CL6-2024-CLIMATE-01-6: Ocean models for seasonal to decadal and local to regional climate predictions, and Cluster 5 topics: HORIZON-CL5-2024-D1-01-02: Inland ice, including snow cover, glaciers, ice sheets and permafrost, and their interaction with climate change, HORIZON-CL5-2024-D1-01-01: Enhanced quantification and understanding of natural and anthropogenic methane emissions and sinks, and HORIZON-CL5-2023-D1-01-02: Climate-related tipping points.

Call - Land, oceans and water for climate action

HORIZON-CL6-2024-CLIMATE-01

Conditions for the Call

Indicative budget(s)³⁶⁶

Topics	Type of	Budgets (EUR	Expected EU contribution per	Indicative number
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³⁶⁵ Dedicated ESA invitation to tenders to be launched in 2023 and 2024 for each of the clusters will be published in the ESA-STAR Tender publication system (<https://esastar-publication-ext.sso.esa.int>).

³⁶⁶ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

	Action	million)	project (EUR million) ³⁶⁷	of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-CLIMATE-01-1	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-CLIMATE-01-2	RIA	5.00	Around 5.00	1
HORIZON-CL6-2024-CLIMATE-01-3	IA	20.00	Around 10.00	2
HORIZON-CL6-2024-CLIMATE-01-4	RIA	12.00	Around 6.00	2
HORIZON-CL6-2024-CLIMATE-01-5	RIA	14.00	Around 7.00	2
HORIZON-CL6-2024-CLIMATE-01-6	RIA	9.00	Around 4.50	2
HORIZON-CL6-2024-CLIMATE-01-7	RIA	5.00	Around 5.00	1
Overall indicative budget		75.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant</i>	The rules are described in General Annex G.

³⁶⁷ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Agreements</i>	
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Proposals are invited against the following topic(s):

HORIZON-CL6-2024-CLIMATE-01-1: Improving irrigation practices and technologies in agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁶⁸ .

Expected Outcome: In line with the European Green Deal’s farm to fork strategy, EU water-related policies (notably the Water Framework Directive), and the work done and data made available by the European Environmental Agency (EEA), successful proposals will contribute

³⁶⁸ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

to increasing the resilience of agriculture to drought with innovative irrigation systems that increase efficiency in water management.

Projects results are expected to contribute to the following expected outcomes:

- Solutions and prevention tools for improving water management in particular in areas experiencing recurrent or permanent water scarcity to anticipate solutions for current and future challenges in water management.
- Support available for end-users seeking to take up innovative solutions in irrigation technologies.
- Unlocking the potential of recycled sewage sludge and other biowaste streams as alternative, safe water and nutrient supply resources for agriculture.
- Increased socio-economic and environmental potential of alternative irrigation practices such as fog harvesting.
- Reduced agricultural water demand, as a result of optimized irrigation systems, including new opportunities for alternative water supplies, and expected innovations from the transition towards more sustainable farming systems, including agroecology.

Scope: Proposals should address the following:

- Improve the understanding of the composition, potential for irrigation in terms of efficiency, reliability and cost-effectiveness of sewage sludge and other biowaste streams, on condition that a safe use of these recycled products is possible, without a negative impact on the environment, ensuring high agronomic efficiency of the nutrients they contain.
- Integration and upscaling of the on-farm water management practices and results at the catchment level by quantifying the impacts of water recycling in the whole basin water balance, optimizing catchment-based agriculture production, reducing runoff patterns and possible changes in hydrological cycles linked to climate conditions.
- New or improved tools for an efficient combined use of water and fertilizers via irrigation for different agricultural systems, including agroecology, organic production, as well as conventional, intensive or urban agriculture.
- New, innovative forms of alternative water for agriculture (e.g., superabsorbent polymers/‘solid water’), including evaluation of their socio-economic, environmental and health impacts.
- Improve practices and solutions in small and large-scale farms to deal with the effects of water abundance (rapid showers, floods) and/or water scarcity.
- Identification of societal and regulatory barriers hampering upscaling of recycled water-use and development of suitable solutions to increase the uptake in practice.

- Recommendations for improved and targeted incentives and policies at regional, national and EU-level to reduce financial risks for early adopters of practices developed in the project.

Proposals must implement the ‘multi-actor approach’ and ensure adequate participation of the main stakeholders involved in irrigation practices and technologies in agriculture. Proposals should build and expand on the achievements of past and current Horizon 2020 and Horizon Europe research and innovation projects, including as part of the Horizon 2020 art. 185 PRIMA partnership. Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic as well under HORIZON-CL6-2023-ZEROPOLLUTION-01-01: Knowledge and innovative solutions in agriculture for water availability and quality and HORIZON-CL6-2024-BIODIV-02-01-two-stage: Demonstrating Nature-based Solutions for the sustainable management of water resources in a changing climate, with special attention to reducing the impacts of extreme droughts.

The possible participation of the JRC in the selected project would ensure that the approach proposed can be integrated as a scenario in the tool used at the European Commission for the estimation of water availability.

HORIZON-CL6-2024-CLIMATE-01-2: Socio-economic, climate and environmental aspects of paludiculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁶⁹ .

³⁶⁹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Expected Outcome: This topic will support the European Green Deal, notably its climate objectives and the EU proposal for a nature restoration law³⁷⁰ of the EU biodiversity strategy for 2030. Earth's natural terrestrial carbon sinks, in particular peatlands and wetlands, are expected to play a crucial role in reaching EU climate objectives thanks to the conservation and restoration of ecosystems with large potential for carbon sequestration. To reach climate goals, rewetting of 500 000 hectares will be necessary in Europe. By looking into the potential of such areas when used for paludiculture, the topic will contribute to the following impact of the Destination: "Efficient monitoring, assessment, modelling, data-driven decision-making support systems and projections related to climate change impacts, mitigation and adaptation potential in order to derive solutions for tackling emerging threats and support decision-making in climate change mitigation and adaptation policies at European and global levels, including the use of AI and other digital solutions."

Project results are expected to contribute to all of the following expected outcomes:

- Paludiculture systems and their potential to provide jobs and income, while addressing climate mitigation, environmental objectives (notably water quality) and nature conservation, are better understood;
- The EU approach to carbon farming regarding wetlands and peatlands and their restoration, with the aim of reducing oxidation of the existing carbon stock and increasing the potential for carbon sequestration, is supported³⁷¹;
- Innovative solutions to facilitate the development of paludiculture are explored.

Scope: Proposals should:

- Take stock of the main socio-economic variables relevant for the paludiculture sector, including options for marketing of its products, and carry out socio-economic analyses, including projections and foresight;
- Estimate the potential for degraded peatlands and wetlands, currently used for conventional agriculture or forestry (with drainage), to be converted to paludiculture;
- Establish an observatory and databases for analytical purposes, covering the whole supply chain;
- Analyse positive and negative incentives and trade-offs, including with regard to carbon farming, in particular those that relate to the policy environment and to the attitudes and values of farmers and other actors;
- Explore solutions to lift possible lock-ins and speed up the development of paludiculture including with social innovation;

³⁷⁰ Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

³⁷¹ The approach is described in the Communication on "Sustainable Carbon Cycles", COM(2021) 800, 15.12.2021, https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles_en.

- Support the establishment of a network of researchers and practitioners involved in paludiculture at European and global level;
- Include a dedicated task, appropriate resources and a plan on how the project(s) will collaborate with project(s) supported through topic “HORIZON-CL6-2024-CLIMATE-01-3: Paludiculture: large-scale demonstrations”.

Proposals under this topic should build on the results of the project(s) funded under the topic “HORIZON-CL5-2021-D1-01-08: Restoration of natural wetlands, peatlands and floodplains as a strategy for fast mitigation benefits; pathways, trade-offs and co-benefit”. They should also build links with relevant projects funded under Mission ‘Restore our ocean and waters by 2030’ Horizon Europe Work Programme, in particular topics HORIZON-MISS-OCEAN-2022-01-02 “Danube river basin lighthouse: Protection and restoration of wetlands, flood plains, coastal wetlands and salt marshes and their biodiversity”, and under HORIZON-MISS-OCEAN-2021-02-04 “Danube river basin lighthouse – coordination activities” as well as with the Mission implementation monitoring system that will be part of the Mission Implementation Support Platform for reporting, monitoring and coordination of all relevant implementation activities.

This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2024-CLIMATE-01-3: Paludiculture: large-scale demonstrations

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 10.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 20.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: This topic will support the European Green Deal, notably its climate objectives and the EU proposal for a nature restoration law³⁷² of the EU biodiversity strategy for 2030. Earth’s natural terrestrial carbon sinks, in particular peatlands and wetlands, are

³⁷² Proposal for a Regulation of the European Parliament and of the Council on nature restoration, COM(2022) 304 final, 22.06.2022

expected to play a crucial role in reaching EU climate objectives thanks to the conservation and restoration of ecosystems with large potential for carbon sequestration.

Projects results are expected to contribute to all of the following expected outcomes:

- Practical options for the development of paludiculture and pathways for the conversion of degraded organic agricultural and forest soils to paludiculture are demonstrated.
- Recommendations for the approach to be taken towards large-scale deployment of paludiculture are developed.
- The carbon sequestration potential of paludiculture is quantified, including an assessment of its potential contribution to the achievement of EU targets.

Scope: Project activities should:

- Establish large-scale paludiculture demonstration in three areas of at least 50 hectares each;
- Involve all relevant actors (farmers/foresters, scientists, advisors, local/regional public authorities, industry, etc.) throughout the different stages of project development and implementation;
- Consider the potential for activities demonstrated in the project(s) to be replicated and scaled up, and to this end develop recommendations for policymakers and land managers;
- Include a dedicated task, appropriate resources and a plan on how the project(s) will collaborate with other projects funded under this topic and with project(s) supported through topic “HORIZON-CL6-2024-CLIMATE-01-2: Socio-economic aspects of paludiculture”.
- Where relevant, build links with projects funded under Horizon Europe Missions, in particular the Missions “A Soil Deal for Europe”, “Adaptation to Climate Change”, and “Restore our ocean and waters by 2030”. Relevant topics from the Mission work programmes include HORIZON-MISS-OCEAN-2022-01-02 “Danube river basin lighthouse: Protection and restoration of wetlands, flood plains, coastal wetlands and salt marshes and their biodiversity” and HORIZON-MISS-OCEAN-2021-02-04 “Danube river basin lighthouse – coordination activities”, as well as the Mission implementation monitoring system that will be part of the Mission Implementation Support Platform for reporting, monitoring and coordination of all relevant implementation activities.

HORIZON-CL6-2024-CLIMATE-01-4: Land use change and local / regional climate

Specific conditions	
<i>Expected EU</i>	The Commission estimates that an EU contribution of around EUR 6.00

<i>contribution per project</i>	million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>

Expected Outcome: Project implementation is expected to contribute to mitigation of and adaptation to climate change and to help achieve climate-neutrality in the land-use sector by 2035 (combining net removals from Land Use, Land Use Change and Forestry with biogenic emissions from agriculture) and climate neutrality of all sectors by 2050.

Projects results are expected to contribute to all of the following expected outcomes:

- Solutions are made available for understanding, modelling and optimising the relationships between net removals from Land Use, Land Use Change and Forestry (LULUCF) and biogenic emissions from the agriculture sector at local / regional level;
- Strategies are developed at local and regional level to deal with impacts of climate change and to maximise co-benefits for other objectives, including biodiversity protection.

Scope: The conservation and enhancement of Earth’s natural terrestrial carbon sinks such as soils and plants in forests, on farmed lands as well as peatlands and wetlands is crucial. The European Green Deal and EU sectoral policies such as the common agricultural policy give research and innovation (R&I) a significant role to play in supporting the design and implementation of policies that will ensure the achievement of the EU’s climate objectives.

Project activities should:

- Analyse, model and project impact of past, present and future land use and land use change on the local and regional evolution of the climate, including as appropriate the use of remote sensing technologies (Copernicus) combined with innovative processing and AI;

- Develop strategies for policy-making to mitigate adverse evolutions of climate at the regional/landscape level, including with regard to trade-offs between different objectives (climate change mitigation and adaptation, food and biomass production, biodiversity protection);
- Propose solutions for improved land management, making use of afforestation, integrated land use change and management practices (e.g. hedges, agro-forestry), extensification and rewetting of organic soils, improved forest management and better use of biomass for long-lasting wood products, more efficient use of fertilisers, dietary changes, etc.;
- Include dedicated tasks and appropriate resources to collaborate with other projects financed under this topic as well as with projects under Destination 1, “Climate sciences and responses for the transformation towards climate neutrality”, of Horizon Europe Cluster 5, “Climate, Energy and Mobility”, and with relevant projects under the Missions “Adaptation to Climate Change” and “A Soil Deal for Europe”.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-CLIMATE-01-5: Climate-smart use of wood in the construction sector to support the New European Bauhaus

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 14.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000. Eligible costs will take the form of a lump sum as defined in the

	Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁷³ .
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Expected Outcome: This topic will support the New European Bauhaus initiative and the implementation of the new EU forest strategy by making the construction sector more renewable and circular especially for existing buildings, which includes the use of currently underused timber such as hardwoods, salvage wood and post-consumer wood for traditional and newly emerging innovative woody biomass-based applications, while including circularity as part of a broader system and design loop.

Projects results are expected to contribute to all of the following outcomes:

- Enhanced contribution of the forest-based sector with respect to climate change mitigation and adaptation, a toxic-free environment and rural development objectives.
- Pathways for an efficient conversion of solid biomass into forms of long-term carbon storage.
- Enhanced contribution of the forest-based sector to decarbonisation strategies for buildings, both in terms of operational emissions, embodied emissions, and carbon removals, in relation to the Energy Performance of Buildings Directive, the renovation wave strategy, the Construction Products Regulation and other EU policies on buildings.
- Contribute to a robust and transparent methodology to quantify the climate benefits of wood construction products and other building materials, reflecting the most advanced dynamic life-cycle analyses and in view of contributing to the carbon farming initiative and carbon removal certification.
- Increased resource efficiency and minimisation of environmental footprint of wood products used in construction works.
- Better knowledge about the quantitative limits of global wood supply and the limits of wood as a resource.

Scope: Wood materials remain considerably under-utilised in the construction sector despite their durability and appreciation by end users. At the same time, there is a need for making the construction sector more renewable and circular, which includes the use of currently underused timber such as hardwoods, damage wood and post-consumer wood, while including circularity as part of a broader system and design loop. This requires new raw

³⁷³ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

material sources and secondary material, technologies, and designs for wood components, specified products and for wooden buildings. Buildings need also to be adapted to climate change, including as regards summer and winter thermic performance.

Proposals will:

- Analyse the potential market and new technologies (such as the use of AI, IoT sensors or robotics) as well as processes for the utilisation of hardwoods, low quality, damage, and post-consumer wood in the construction sector, including for the refurbishment of buildings.
- Explore the potential of zero-waste concepts by developing solutions for each source type to turn into viable products as elements and as whole buildings in the wood construction sector.
- Design wood building blueprints based on these products and other underutilised bio-based materials, taking into account the reuse, adaptability and healthy living environment (e.g. avoidance of hazardous substances) into the design.
- Study and integrate human health and wellbeing aspects, as well as the cultural traditions of local crafts and design languages, as integral elements of the built space.
- Analyse and propose systems to overcome technical, logistical, legal, business, political, economic, knowledge and social barriers, challenges and opportunities and derive integrated policy recommendations and business strategies for enlarging the wood construction sector in Europe.
- Include the reuse, recycling, renovation and deconstructivity into product and building design concepts.
- Develop robust, transparent and cost-effective methodologies to quantify the carbon removal benefits of key wood construction products and other building materials.
- Develop roadmaps to mainstreaming multi-story wood buildings in Europe, which are the main market segment in living and commercial/office spaces in cities.
- Engage with relevant stakeholder in co-creation processes (e.g., the New European Bauhaus Community of Partners, policy, architects, business, insurance, investment, society, public and private sector).
- Link with other selected proposals and the NEB Lab and establish an open-access wood construction observatory in Europe, to monitor and update progress, statistics, good practice guidelines and solutions on wood construction.
- Address policy frameworks and standards that are still hindering innovation and further market development, as well international production norms and standards for assessing the ecological effects, climate adaptation and climate footprint of buildings which do not account for all benefits of wood.

The project must implement the multi-actor approach and ensure an adequate involvement of the primary production sector and the wider forest-based value chain

This topic should involve the effective contribution of SSH disciplines and capitalise on previous research results (e.g., BASAJAUN³⁷⁴, Build-in-Wood³⁷⁵, etc.), as well as the results of the LIFE Strategic Projects from the LIFE Circular Economy and LIFE Quality and Climate Action Sub-programmes.

Proposals are encouraged to/should consider social innovation when the solutions is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

Proposals may involve financial support to third parties e.g. to primary producers, academic researchers, start-ups, SMEs, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. Consortia need to define the selection process of organisations, for which financial support may be granted. Maximum 20% of the EU funding can be allocated to this purpose.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-CLIMATE-01-6: Ocean models for seasonal to decadal regional climate impacts and feedbacks

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.

³⁷⁴ <https://cordis.europa.eu/project/id/862942>

³⁷⁵ <https://cordis.europa.eu/project/id/862820>

Expected Outcome: Successful proposals will contribute to the European Green Deal, addressing resilience to climate change (mitigation and adaptation) in coastal areas. Improved ocean models for 21st century climate projections, from regional to coastal scales, and from seasonal to decadal timeframes, will support the sustainability of the blue economy and the protection of ocean health and coastal landscapes.

The proposals will support the Digital and Green Transitions and will directly support Destination Earth³⁷⁶ and the development of the Digital Twins, and the Digital Twin Ocean³⁷⁷ in particular. They should contribute to the improvement of marine information services provided by European programmes like Copernicus, and their uptake at local, coastal and EU regional levels.

Project results are expected to contribute to all the following expected outcomes:

- Demonstration of the fit for purpose and configuration of ocean models, for climate change impact assessment in European sea basins and coastal areas, in particular on marine ecosystems;
- Demonstration of EU basin scale to coastal ocean climate services that support policy implementation and the development of climate adaptation strategies and of a carbon-neutral blue economy (e.g., ocean climate risk services);
- Development and publication of indicators on ocean status and health, targeted towards territorial decision-makers, complementary to current Global Climate Observing System (GCOS) Essential Climate Variables³⁷⁸ or Copernicus Ocean State Reports³⁷⁹;
- Integration of the developments in the digital perspective, interoperable and/or integrable with Destination Earth and the Digital Twin Ocean;
- Fostered collaboration between the climate science community and operational oceanography communities (operating ocean services on a sustained way).

Scope: A current limitation to climate change projections for EU-basin scale to coastal use comes from an insufficient representation and resolution of basin and coastal ocean dynamics and from an unsatisfactory understanding of the oceanic biogeochemical cycle. Most climate models include the ocean dimension that stops at the regional scale as defined by meteorology and climatology like in CORDEX In parallel, operational oceanography centres develop and operate ocean models (physics, biogeochemistry, sea-ice) for daily ocean forecasting and reanalysis that represent more exhaustively the full ocean dynamics. Methods should help close the gap between current climate projections (global, centennial) on the one hand and existing Copernicus Marine physics and biogeochemical models used for daily ocean forecasting.

³⁷⁶ [Destination Earth | Shaping Europe's digital future \(europa.eu\)](https://european-council.europa.eu/media/en/press-communications/infographic/infographic_destination-earth_en.pdf)

³⁷⁷ [European Digital Twin of the Ocean \(European DTO\) | European Commission \(europa.eu\)](https://european-council.europa.eu/media/en/press-communications/infographic/infographic_digital-twin-ocean_en.pdf)

³⁷⁸ [GCOS | WMO](https://www.wmo.int/essential-climate-variables)

³⁷⁹ [Ocean State Reports | CMEMS \(copernicus.eu\)](https://marine.copernicus.eu/ocean-state-reports)

Proposals are expected to focus on:

- Developing capabilities for producing decadal to long-term (multi-decadal to centennial) refined predictions of the ocean state, at the scale of European regional seas including the coastal zones, where climate change risk is considered to be particularly high;
- Improving the representation of ocean processes (and dynamics, especially at regional to coastal scale) that can be integrated in climate models;
- Developing capabilities for producing decadal to long-term EU basin scale predictions of biogeochemistry models to support feedback into global/regional marine ecosystem models and climate models;
- Validating the approach by performing historical runs and comparing corresponding model results to observations, proxy information, and / or reanalyses over an instrumental multi-decadal period, up to centennial scales, with characterized uncertainties;
- Investigating and assessing the quality of coastal models or ecosystem models of the low to mid trophic food web levels, over European seas and their coastal zones, with characterized uncertainties.

Methodology and developments should be benchmarked with two relevant use cases, to be showcased in three different European regional seas and coastal areas involving both scientists and end users:

- Development and demonstration of regional ocean climate risk services in coastal areas, due to sea level rise, waves, surges, or any other extreme event;
- Development and demonstration of regional ocean climate services in coastal areas supporting the blue economy (e.g. aquaculture, marine renewable energies, tourism).

Proposals shall demonstrate that the targeted scientific framework, ocean models integrated into EU basin scale climate models and resulting in basin scale ocean services for the marine and maritime sectors can be replicable to all EU regional seas. Proposals should plan resources for coordination and networking activities with related projects, in particular those funded under the Missions “Restore our Ocean and waters by 2030” and “Adaptation to Climate Change”, as well as with relevant projects funded under Cluster 4 – Space addressing Copernicus services (marine, land, emergency, climate), Cluster 5 Destination “Climate sciences and responses for the transformation towards climate neutrality”, and Cluster 6, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities to break the silos between science communities.

The proposal should favour open data, open source, and public-use models and algorithms with open source licensing and integrable in the Digital Twin of the Ocean. Proposals should

leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud, as well as data from relevant Data Spaces in the data-driven analyses. Projects could additionally benefit from access to infrastructure and relevant FAIR data by collaborating with projects funded under the topics HORIZON-INFRA-2022-EOSC-01-03: FAIR and open data sharing in support of healthy oceans, seas, coastal and inland waters and HORIZON-INFRA-2024-EOSC-01-01: FAIR and open data sharing in support of the mission adaptation to climate change.

Synergies and complementarities: HORIZON-CL6-2023-CLIMATE-01-08: Closing the research gaps on ocean Essential Climate Variables (ECVs) in support of global assessments, relevant EU Research Infrastructures.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2024-CLIMATE-01-7: EU-China international cooperation on improving monitoring for better integrated climate and biodiversity approaches, using environmental and Earth observation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>In order to achieve the expected outcomes and to implement the Climate Change and Biodiversity Flagship in compliance with the provisions of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People’s Republic of China (MOST), on a Co-funding Mechanism for the period 2021-2024 to support Collaborative Research and Innovation projects under the “Food, Agriculture and Biotechnologies”, and the “Climate Change and Biodiversity” Joint Flagship Initiatives”, and in accordance with the requirements of the Inter-governmental Science and Technology Innovation (STI) Cooperation Special Programme of MOST:</p> <ol style="list-style-type: none"> 1. Consortia must also include as associated partners at least three independent legal entities established in China; and 2. Legal entities established in China can only participate as

	<p>associated partners; and</p> <p>3. Chinese participants must be awarded co-funding by MOST*</p> <p>*This condition will not be fulfilled if, at the time of grant agreement signature, the Chinese participants have not concluded a grant agreement with MOST.</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Grants awarded under this topic will be linked to the specific grants awarded by the Ministry of Science and Technology, China (MOST) to the Chinese partners. The respective options of the Model Grant Agreement will be applied.</p>

Expected Outcome: The successful proposal is aiming to improve terrestrial monitoring as well as maximising synergies with biodiversity conservation and climate mitigation and adaptation, by using or acquiring environmental data, particularly geographically explicit data such as ground-based observation and remote sensed Earth observation data. This with a view to contribute to the objectives of climate-neutrality, adaptation to climate change and reversing biodiversity loss at global levels, with a focus on the EU and China. Synergetic solutions, including nature-based solutions such as the protection, the restoration and the sustainable management of terrestrial land, can contribute to enhancing carbon dioxide removals from the atmosphere, while reducing vulnerability and increasing resilience to climate change impacts, and contributing to biodiversity conservation and restoration.

The successful proposal will furthermore contribute to an advanced understanding of science to support integrated climate and biodiversity actions on natural and managed ecosystems and associated economic sectors. It will do so by advancing solutions for monitoring, assessment and projections to support decision-making in better integrated climate and biodiversity policies in terrestrial ecosystems generally.

The successful proposal is expected to contribute to all of the following outcomes:

- Protect biodiversity and maximize synergetic benefits of biodiversity conservation, climate mitigation and adaptation based on both remote sensing and ground-based observation;
- Development and exchange of best practices in using ground-based observation and Earth observation data and information, and establish standard and indicator system for biodiversity measurement for better integrated approaches in order to deliver increased synergies between mitigation, adaptation and conservation.

- Geographically-explicit monitoring on regions that has been identified high biodiversity value and/or subject to biodiversity protection and restoration provisions due to high climate risk;
- Strengthen scientific research in supporting of the synergies between the monitoring and reporting frameworks under the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention on Biological Diversity (CBD), including on the impacts of climate change on biodiversity, for better implementation and progress assessment of the post-2020 global biodiversity framework.

Scope: The EU and China face similar challenges as a result of climate change where it comes to biodiversity related aspects, while reaching climate neutrality will require critical contributions from terrestrial land, including through enhancing net carbon dioxide removals. Similar challenges could benefit from similar actions and defining best practices in improving monitoring of terrestrial ecosystems in order to design better approaches integrating climate change adaptation and mitigation, and biodiversity conservation.

The successful project should provide improvements in biodiversity monitoring infrastructures in support of integrated approaches able to deliver better synergies between mitigation, adaptation and conservation. Such integrated approaches can include a wide range of mitigation options, such as protection and restoring natural ecosystems, sustainable land management practices, sustainable forest and grassland management. Such options, based on a smart use of natural ecological processes and improved technologies, contribute to improving the quality, diversity and resilience of ecosystems, all of which have substantial benefits for biodiversity.

Most monitoring instruments for climate and biodiversity indicators on terrestrial land are carried out in a non-integrated manner and are based on statistical inventories without explicit geographical resolution. Earth observation (including satellite and near surface remote sensing as well as ground based methods), alongside analysis tools such as Geographic Information Systems, can be combined as multiple geographically-explicit data sets. Data acquisition, processing, cross-referencing and coherent integration on terrestrial land require substantial research and innovation investments.

Improving ground-based monitoring for better integrated approaches should assess or set up a strategy to assess the potential of natural and managed terrestrial ecosystems to contribute to:

- climate mitigation, including enhancing net carbon removals,
- climate adaptation, including resilience and disaster risk prevention, and
- protection, conservation and restoration of biodiversity.

Improving existing monitoring, including through designing new datasets and methods to set up a geographically-explicit monitoring of climate and biodiversity aspects fits within the scope of this topic.

The successful proposal should contribute to a strengthened cooperation between the EU and China, also in the context of a better cooperation under the Group on Earth Observations initiatives, building on the climate and biodiversity monitoring networks in China and the EU.

This topic is part of the EU-China flagship initiative on Climate Change and Biodiversity, which will promote substantial coordinated and balanced cooperation between the EU and China and is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

The use of existing data and information coming from e.g. Copernicus and GEOSS is encouraged. Interaction with other actions developed under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and/or the Flagship on Food, Agriculture and Biotechnologies is encouraged, as well as related topics within Cluster 5 and 6 and existing cooperation between the EU and China on land, including soils.

Destination - Resilient, inclusive, healthy and green rural, coastal and urban communities

Places and people matter when it comes achieving of a more sustainable Europe. The Sustainable Development Goals and the ecological and digital transitions brought forward by the European Green Deal with its farm to fork and biodiversity strategies, zero pollution action plan, common fisheries policy (CFP)³⁸⁰, along with the recent pandemic, bring challenges and opportunities that vary for different places and people. Rural (including mountains and sparsely populated areas) and coastal areas, play a key role in protecting, managing, and using natural resources. The provision of both private and public goods from these areas depends on the resilience and attractiveness of communities there and the capacity of people living and working there to enjoy an adequate level of well-being, which should be guaranteed by, e.g. the access to good quality services. The COVID-19 pandemic has highlighted deficiencies in digital infrastructures and economic opportunities that hamper resilience. It also highlighted the importance of high-quality and biodiverse green and blue spaces for the health and well-being of local communities, in primis, but also for that of visitors of these areas.

Innovation is a key enabler of the long-term vision for the EU's rural areas (LTVRA)³⁸¹ that aims to overcome the challenges outlined above and make rural areas stronger, connected, resilient and prosperous by 2040. Urban communities generally offer better access to many services but are also more vulnerable to supply-chain disruptions, as shown during the COVID-19 pandemic. Furthermore, they have a key role to play in fostering sustainable production and consumption as major demand drivers. The New European Bauhaus initiative³⁸² offers possibilities to redesign living spaces to improve sustainability, inclusiveness, and aesthetics, setting out a path to a more resilient, inclusive, healthy and green (built) environment. In all communities, social, cultural and behavioural drivers play an important role in either enabling or slowing down transitions. Knowledge and innovative solutions need to be developed to strengthen every community's resilience and capacity to contribute to and benefit from the upcoming transitions in an economy that works for all territories and ensures a fair and just transition leaving no one behind.

Under this destination, transdisciplinary R&I with a strong social, behavioural and humanities sciences dimension (SSH), which pay and attention to gender aspects, will enable a sustainable, balanced, equitable and inclusive development and management of rural, coastal and urban areas in three different ways.

Firstly, it will aim to **increase our understanding** of the different ways of climate, environmental, socio-economic and demographic changes affect rural, coastal and urban areas in order to identify ways to turn these changes into equal, and, when needed equitable,

³⁸⁰ Common Fishery Policy https://oceans-and-fisheries.ec.europa.eu/policy/common-fisheries-policy-cfp_en.

³⁸¹ Long Term Vision for Rural Areas, https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/long-term-vision-rural-areas_en.

³⁸² https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_4627.

opportunities for people wherever they live. This would strengthen territorial cohesion and enable a just transition. Secondly, it will **explore innovative ways to tailor policy responses** to the place-based challenges and needs identified at various levels of governance. Thirdly, it will **support bottom-up community-led innovation** to empower communities to develop, test and upscale solutions that answer global challenges in locally adapted ways. Achieving policy goals require providing people with more equitable access to the knowledge and skills needed to make informed choices and ensure they are actively engaged in the conservation. It also requires natural resources to be managed in a sustainable and circular manner, from production or service provision to consumption, in the spirit of the EU competence framework for sustainability. Rural, coastal and urban communities need improved labour conditions, quality of life and long-term socio-economic prospects in the context of major transitions and rising threats to climate, resources and health. This is particularly the case for women, young people older people, people with disabilities, people in vulnerable situations (e.g. income falling below the poverty line, or at risk of poverty), migrants, ethnic minorities and indigenous people and those hit the hardest by the COVID-19 pandemic. Their capacity to drive community-led innovations and their resilience must be increased across the diverse European territories including remote and peripheral places such as mountains, forests, archipelagos, sparsely populated areas, as well as the Arctic. The necessary changes will be facilitated and resilient, smart, and climate friendly production and lifestyles will be supported through mobilising the forces of i) digital transformation, ii) upgraded innovation ecosystems, iii) cultural and natural heritage, iv) nature-based solutions, more sustainable and regenerative tourism as well as social and policy innovation will facilitate necessary changes and support resilient, smart, and climate friendly production and lifestyles.

This destination will in particular:

- Address the spatial and socio-economic or behavioural drivers of the **European Green Deal** (including farm to fork, biodiversity and sustainable and smart mobility strategies), especially its just transition component.
- It will make a key contribution to the **flagship initiative ‘R&I for rural communities’** and to the four areas of work under the **long-term vision for the EU’s rural areas**: making areas stronger, connected, resilient, prosperous. It will in particular help achieve to climate targets by putting the focus on the climate-neutrality of rural communities that have specific needs and are often neglected by climate action.
- It will complement the **New European Bauhaus (NEB) initiative** that connects the European Green Deal to our living and public spaces; The NEB aims to achieve deep transformation of these spaces, closely involving the public, and integrating the core NEB values of sustainability, inclusion and aesthetics. It will make a key contribution to improving **social inclusion** in Europe in line with the principles of the **European pillar for social rights**, the **EU social economy action plan** and contributing to the **strategy for the rights of persons with disabilities for 2021-2030**.

- It will contribute to the: i) implementation of the **new joint communication on the Arctic** (adopted on 13 October 2021), ii) the fourth Arctic Science Ministerial Joint Statement³⁸³ and iii) to the All- Atlantic Ocean Research Alliance.
- It will contribute to the: i) implementation of the **competence framework for sustainability** prepared by the Commission³⁸⁴ and the Council Recommendation on education for environmental sustainability for learners of all ages and at all levels of education (part of the EU biodiversity strategy for 2030)³⁸⁵.
- It will help implement the **EU agenda for tourism** (expected in late 2022).
- It will contribute and link to the **just, green and digital transitions** called for by the European Green Deal, the European industrial strategy, the circular economy action plan and the updated bioeconomy strategy, by exploiting the potential of digital technologies (e.g., using local digital twins for participatory urban planning and evidence-based policy-making).

The following outcomes are expected.

- Policy makers and the public will have a better citizens understanding of **social inclusion challenges**, the circumstances of **people in vulnerable situations in rural and coastal areas** and how to strengthen **social resilience**, including in relation to ecosystem services, biodiversity and natural heritage for coastal areas.
- Policy makers will have a better understanding of the **behavioural and structural drivers of people's lifestyle choices and people's perceptions of rural life** in the aftermath of COVID-19 and of the long-term trends and opportunities for rural areas.
- A **sustainable post-COVID recovery will be enabled in urban, rural and coastal communities** through biodiversity-friendly actions, and valorisation of natural and cultural heritage for sustainable recovery, professional, collective and personal attitudes.
- There will be an improvement **connections, strategies and governance arrangements that enable synergistic development of rural, coastal and urban areas** and more integrated territorial policies and interventions in a growing number of localities and across several sectors.
- **Rural, urban and coastal actors will be engaged in a just and green transition. They will be** equipped with strategies and innovations to contribute to the EU's climate-neutrality by 2050 and benefit from a climate-neutral economy.

³⁸³ The Commission has signed the Joint statement of the third Arctic science ministerial and committed to further support Arctic science, including integrating traditional and indigenous knowledge.

³⁸⁴ <https://ec.europa.eu/jrc/en/greencomp>.

³⁸⁵ https://education.ec.europa.eu/sites/default/files/2022-01/proposal-council-recommendation-learning-environmental-sustainability_0.pdf.

- Prosperity will increase thanks to the deployment of business models that are fit for the future and greater job opportunities will be provided for rural and coastal people, particularly in relation to territorial and marine economies and critical resources (soil, water, biodiversity). This is in line with the objectives of the EU Missions ‘A Soil Deal for Europe’, ‘Restore our Ocean and Waters’, and ‘Adaptation to climate change’.
- More **innovative and integrated policy framework will be upgraded and developed**, capitalising on international knowledge exchange, including indigenous, traditional and local knowledge³⁸⁶ and cultural heritage in a bottom-up approach.
- Knowledge on the costs and benefits of **urban farming** and improved policy frameworks will be strengthened to maximise its benefits for European society at large across all dimensions of sustainability.
- More **diverse and systemic approaches and innovative solutions** (digital, nature-based, social and community-led) will be developed **with and for local communities** and there is an increase in the number of local actors with improved capacity to sustain these innovative processes and take up these solutions.
- Connections between food provision and multi-functional nature-based solutions for the benefit and well-being of people will be increased. Resilience (climate adaptation mechanisms) will also increase through the combination of the vision of the **New European Bauhaus initiative** to ‘*call on all Europeans to imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls*’ with a sustainable food systems approach and make use of Novel sources of inspiration will be put to best use.
- **Understanding, support and engagement will increase** among young people, professionals, authorities, decision makers and the public **for all dimensions of sustainability**.
- Local, coastal and policy communities will use coastal and nature-based heritage, culture and ecosystem services as a basis for potentially year-round diversified sustainable eco-tourism activities.
- A framework will be developed to measure communities’ well-being beyond economic indicators (e.g. social, environmental) and use both to create collaborative community management models, including for sustainable and/or regenerative tourism.

Expected impact

Proposals for topics under this destination should set out a credible pathway to achieving **resilient, inclusive, just, healthy and green rural, coastal and urban communities** and more specifically one or several of the following expected impacts:

³⁸⁶ Reference for using this expression is UNESCO work: <https://en.unesco.org/links>.

- **Rural, coastal and urban areas are developed in a sustainable, balanced, equitable and inclusive manner** thanks to a better understanding of the i) environmental, socio-economic, behavioural, cultural, architectural and demographic structures, ii) needs and drivers of change and their interconnections, and iii) how digital, nature-based, social and community-led innovations are deployed.
- **Rural, coastal and urban communities are empowered to i) act for change**, ii) be better prepared to achieve climate-neutrality and adapt to climate change, and iii) use the digital and green transitions to increase resilience and provide positive long-term prospects.
- **Rural communities are equipped with upgraded innovation ecosystems and innovative and smarter circular solutions** that i) increase access to services and job opportunities, including for women, young people in vulnerable situations, ii) increase their attractiveness and iii) reduce the feeling of being left behind, even in remote locations like mountains and outermost regions.
- **Sustainable development of coastal areas**, including coastal protection and resilience, is enhanced, reaping the benefits of social, digital and community-led innovations, to deliver nature-based and scientifically validated solutions to current coastal socio-economic and environmental threats.
- **Urban and peri-urban communities** – including people in vulnerable situations – can access, afford and choose healthy, nutritious and environmental-friendly food.

Communities in natural and coastal areas can offer sustainable, quality, environmentally and socially friendly tourism, recreational and leisure activities.

Proposals are invited against the following topic(s):

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023-COMMUNITIES-01	38.50		12 Apr 2023
HORIZON-CL6-2024-COMMUNITIES-01		15.00	22 Feb 2024
HORIZON-CL6-2024-COMMUNITIES-02		22.00	22 Feb 2024 (First Stage) 17 Sep 2024 (Second Stage)

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

Overall indicative budget	38.50	37.00	
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Call - Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2023-COMMUNITIES-01

Conditions for the Call

Indicative budget(s)³⁸⁷

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁸⁸	Indicative number of projects expected to be funded
		2023		
Opening: 22 Dec 2022 Deadline(s): 12 Apr 2023				
HORIZON-CL6-2023-COMMUNITIES-01-1	RIA	10.00	Around 5.00	2
HORIZON-CL6-2023-COMMUNITIES-01-2	IA	11.00	Around 5.50	2
HORIZON-CL6-2023-COMMUNITIES-01-3	CSA	3.00	Around 3.00	1
HORIZON-CL6-2023-COMMUNITIES-01-4	RIA	3.00	Around 3.00	1
HORIZON-CL6-2023-COMMUNITIES-01-5	RIA	5.00	Around 5.00	1
HORIZON-CL6-2023-COMMUNITIES-01-6	RIA	6.50	Around 6.50	1
Overall indicative budget		38.50		

General conditions relating to this call

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General

³⁸⁷ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁸⁸ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

	Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-COMMUNITIES-01-1: Enhancing social inclusion in rural areas: focus on people in a vulnerable situation and social economy

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected Outcome: The successful proposals will contribute to fostering a sustainable, balanced, equitable and inclusive development of rural areas, supporting the implementation of the following Commission’s priorities: the European Green Deal, in particular its fair and just transition component; an economy that works for people as well as to the European pillar of social rights, the EU social economy action plan; and a new push for European democracy, notably to the long-term vision for the EU’s rural areas objectives (in particular contributing to rural areas’ resilience), and the strategy for the rights of persons with disabilities 2021-2030.

Project results are expected to contribute to all of following expected outcomes:

- Improved understanding of policy makers at different levels (European, national, regional and local) and citizens regarding the challenges to address disparities and marginalisation in rural areas, the various needs of people in a vulnerable situation, and how to enhance social inclusion, social resilience and well-being;
- Improved policies and governance frameworks for social inclusion and social economy in rural areas;
- Increased economic opportunities and development of social entrepreneurship in rural areas;
- Improved social integration and access to adequate services for people in a vulnerable situation in rural areas and to rural dwellers more in general.

Scope: Projects funded under this topic will contribute to build more inclusive, social resilient and prosperous European rural areas by improving the understanding of social inclusion and social economy challenges in rural areas, by taking stock of existing policies responses, and solutions for the provision of adequate services to the population in a vulnerable situation and for enhancing social economy and entrepreneurship.

Projects will also address these challenges by piloting innovative solutions that foster social economy and improve social inclusion of people in a situation of vulnerability.

Proposals are expected to:

- Identify and analyse the drivers of social exclusion and the challenges to address disparities and marginalisation in various rural areas in Europe, (e.g., remote rural areas, rural areas in the EU's outermost regions (defined in article 349 TFEU), coastal and mountain areas, rural areas close to towns and cities);
- Gain a better understanding of the needs of and challenges faced by people in a vulnerable situation in various rural areas of Europe, the possible ways to address economic and demographic challenges, including ageing, disability, and vulnerability of young people where relevant (in particular those not in employment, education or training NEET), and accessibility to adequate services (e.g. considering also universal design), including social ones (e.g. for people with mental or physical disabilities);
- Benchmark policies, services, including social ones, and initiatives developed at various levels to empower people in a vulnerable situation to full and effective participation and inclusion in society, including social economy and entrepreneurship (e.g., social farming, itinerant services and mobility, multishops), pooling of services and creation of meeting places to enhance social interaction (e.g., multidisciplinary health houses, associative cafés), public-private partnerships, and rural-urban linkages. Assess the quality, strengths and weaknesses of these services and to what extent they are used by/reach the target groups;

- Explore the role, potential and limitations of social economy and social enterprises in supporting the population in a vulnerable situation in rural areas, including for the provision of basic and adequate social services;
- Make policy recommendations on how to improve service delivery and other relevant measures in order to meet the needs of people in a vulnerable situation, as well as on how to create an enabling framework for the upscale of social economy in rural areas;
- Accompany pilot innovation actions supporting people in a vulnerable situation and social entrepreneurship to draw additional knowledge from concrete examples.

Proposals should be innovation-oriented and must implement the multi-actor approach, bringing together multiple science fields, in particular the social sciences and humanities (SSH) (e.g., sociology, behavioural sciences, psychology, economics, etc.), and actors with complementary roles and experiences (e.g., representatives of people in a vulnerable situation, service providers, health services, associations, public authorities, universal designers, etc.).

Proposals should cover a representative variety of European rural areas, consider various types of vulnerability (including gender and intersectionality when relevant), and take stock of and experiment a variety of social economy and service provision examples.

Projects should build on existing results, findings and good practices. For instance they could explore activities undertaken by Horizon Europe projects funded under the topics HORIZON-CL2-2022-TRANSFORMATIONS-01-02 and HORIZON-CL2-2021-TRANSFORMATIONS-01-03.

Finally, projects funded under this topic should coordinate activities between them to avoid overlaps and benefit from synergies. Proposals should allocate appropriate budget and resources to implement this task.

HORIZON-CL6-2023-COMMUNITIES-01-2: Improving rural future through better territorial governance and rural-urban synergies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 11.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must

	use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: The successful proposal will contribute to fostering a sustainable, balanced equitable and inclusive development of rural areas, supporting the implementation of the European Green Deal, in particular to the farm to fork and the biodiversity strategies, the organic action plan, the common agricultural policy (CAP), the long-term vision for the EU's rural areas and its objectives (contributing to make rural areas stronger, connected, resilient and prosperous) and to its flagship initiative “Research and innovation for rural communities”, and the EU territorial agenda for 2030.

Projects results are expected to contribute to all of following expected outcomes:

- Improved connections, strategies and governance arrangements that foster synergistic development and just transition of rural and urban areas and more integrated territorial policies and strategies in a growing number of localities;
- Improved business and innovation opportunities thanks to a more proximate, circular and green economy and renewed vitality of rural places through a better connectivity, improved valorisation of cultural and natural heritage, and stronger innovation ecosystems;
- Improved mutual access of rural and urban actors to services provided by either type of areas;
- Improved social connectivity, social capital, resilience, and capacity to face changes as well as of innovating, and increased understanding of the cultural connections between rural and urban communities and strengthened sense of territorial identity.

Scope: Rural and urban areas are interdependent and can mutually benefit from a territorial planning that takes into consideration their interactive relationship.

People, goods, services, information, financial capitals, energy, etc. flow between these areas, but these linkages are often neglected by policy makers that tend to deal with rural and urban issues separately. Proposals should aim at improving rural-urban cooperation, connections and planning for an integrated territorial development that adopts equitable measures to respond to socio-environmental disparities and foster sustainable growth.

Proposals are expected to support specific projects for developing rural-urban territorial partnerships to enhance the well-being of rural and urban people, increase resilience and favour a more synergistic/interlinked/networked development of rural and urban areas.

Proposal should also prioritise experimentation and innovation in domains that have been demonstrated to favour bi-directional urban-rural synergies and the development of a well-being economy: proximity (shortening distances/value chains including in the agri-food sector with particular attention to organic production), greener economy/society (e.g. ecosystem services and protection and restoration of biodiversity and natural capital, including nature-based solution – NBS), circularity (closing loops/ flows), services (improving social connectivity, new ways of working and living, pooling of and/or itinerant services), culture, landscape and heritage (building territorial identities as well as improving access to a valorised cultural heritage and cultural life) and mobility (sustainable and affordable mobility alternatives for rural residents).

Projects financed under this topic should capitalise on lessons learnt to further upgrade and future-proof policy frameworks and enabling environments.

Proposals should pay attention to the ecological and digital transitions, the potential of digital technologies as well as social inclusiveness, environmental knowledge and access of rural communities to good quality services and opportunities. In addition, they should analyse the impact caused by COVID 19 pandemic on integrated territorial development and address challenges that resulted from it.

Proposals must implement the multi-actor approach and bring together multiple science fields, in particular the social sciences and humanities (SSH) (e.g., economics, human geography, political science, cultural studies, etc.), and actors with complementary roles and experiences (e.g., service providers, transport services, public authorities, associations, innovators, small and medium enterprises -SMEs - etc.).

Proposals should cover a representative variety of European rural areas (e.g. rural-costal areas, mountains areas, remote rural areas) and build on results of relevant Horizon 2020 projects such as RURBAN, ROBUST (e.g., rural-urban learning hub), COASTAL, RURITAGE, RURALURE, SmartCulTour, TExTOUR, and FOODSHIFT 2030 and seek to improve/uptake governance and role models they have identified as promising.

Projects financed under this topic should create synergies with the New European Bauhaus (NEB) projects, facilitating ideas flows from urban to rural settings and vice-versa. For instance, some NEB projects could inspire good practices on the reuse of buildings in rural areas that can function as innovation hubs or build links between urban and rural areas. Proposals should allocate adequate budget and resources to implement this task.

This topic is open to financial support to third parties as an option either to select pilots for developing partnerships or innovative solutions aiming at contributing to integrated territorial development.

Finally, proposals are encouraged to leverage the data and services available through European Research Infrastructures federated under the European Open Science Cloud, as well as data from relevant Data Spaces.

HORIZON-CL6-2023-COMMUNITIES-01-3: International benchmarking of rural and territorial policies and delivery mechanisms

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>Due to the scope of this topic, legal entities established in third countries are exceptionally eligible for Union funding.</p> <p>If eligible for funding, legal entities established in non-associated third countries/name specific countries may exceptionally participate in this Coordination and support action as a beneficiary or affiliated entity.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).³⁸⁹.</p>

Expected Outcome: The successful proposal will contribute to fostering a sustainable, balanced, equitable and inclusive development of rural areas, supporting the implementation of the long-term vision for the EU’s rural areas objectives (contributing to make rural areas stronger, connected, resilient and prosperous), the rural pact, the European Rural Observatory, the European territorial agenda for 2030, and to the European Green Deal more in general, and in particular to the EU climate adaptation strategy.

³⁸⁹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Project results are expected to contribute to all of following expected outcomes:

- Improved understanding of rural development and territorial policies existing across the world, as well as delivery mechanisms by policy makers at different levels (e.g. international, national, regional and local).
- Upgraded and more innovative and integrated rural policy frameworks (e.g. for rural revitalisation and attractiveness, for improving rural innovation ecosystems, for urban-rural linkages, for improved adaptation strategies, plans and measures that aims at addressing climate change in a systemic manner) at different levels (e.g. international, national, regional, local) capitalising on international knowledge exchange to increase inclusive and sustainable rural well-being;
- Enhanced uptake of a positive narrative on the future of rural areas at international level by policymakers.

Scope: The study and implementation of rural policies is unequally advanced across the world. The project funded under this topic should contribute to increase policymakers' understanding of rural challenges and strengthen their capacities to implement adequate policy responses to these challenges in order to increase inclusive and sustainable well-being in rural areas, considering also climate change mitigation and adaptation. Proposals are expected to work by adopting a holistic vision to rural development and/or revitalisation, avoiding a sectorial approach (e.g. rural development should not be limited to agricultural development, but overarch several aspects of the rural life).

Proposals are expected to:

- Perform international benchmarking of rural policies within the EU and third countries who appear as best practice examples of science-society-policy exchange activities, global dialogue on rural policies and capacity building for policymakers working at different levels (e.g., international, national, regional, and local);
- Analyse delivery mechanisms (decentralised vs centralised, quality of multi-level governance, role of politics, etc.) and ways to measure impact combining both quantitative and qualitative methods;
- Focus on multi-dimensional policies (e.g. coordination among different policies and different policy level, from local to international) that address several needs and challenges in an integrated manner;
- Analyse also rural and territorial policies that were developed with and for rural communities and identify effective citizen engagement methods;
- Identify and analyse also successful policy measures aimed at creating opportunities for young people in rural areas;

- Enhance peer-to-peer learning among international, national, regional and local policy makers by experimenting different mechanisms and tools for effective knowledge exchange, even among different levels, on best practices and lessons learnt about rural and territorial policies and delivery mechanisms;
- Provide recommendations to policy makers at different levels (e.g. international, national, regional and local) on how to best address rural needs and challenges and foster sustainable balanced, equitable and inclusive development of rural areas.
- Provide recommendations to policy makers at different levels, in particular regional and local, on how to best access and make use of existing funds.
- Projects should provide relevant results, in particular develop a framework to measure communities' well-being beyond economic indicators (including social, health-related, environmental) to measure policy impacts in rural areas that can be linked with the work of the upcoming EU Rural Observatory.

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines (e.g., economics, international studies, development studies, political science, citizen engagement studies, and human geography).

In order to achieve the expected outcomes, international cooperation is strongly encouraged.

Legal entities from third countries can take part in the project as associated partner or beneficiary.

HORIZON-CL6-2023-COMMUNITIES-01-4: Investigating the contribution of geographical indications (GIs) to sustainable development and optimising support for newly established schemes

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ³⁹⁰ .
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Expected Outcome: The successful proposal should support the objectives of the farm to fork strategy for sustainable food as well as to strengthen the contribution of the system of geographical indications (GIs) to support those objectives.

Project results are expected to contribute to all of the following expected outcomes:

- Better understanding of the contribution of GIs schemes to sustainable development and in particular to achieve the objectives of the farm to fork strategy.
- Sustainability attributes in GI schemes are widely implemented by the producers and recognized and correctly interpreted and understood by consumers.
- Better design and implementation of GIs policy to foster their delivery of sustainable agriculture, aquaculture and fishery, healthy and sustainable diets and sustainable food systems.

Scope: The EU is renowned for its high quality food products having specific characteristics or farming attributes that distinguish them in the marketplace, and particularly those labelled under registered geographical indications (GIs). The quality and diversity of the Union's food production is one of its important strengths giving a competitive advantage to its producers and making a major contribution to its living cultural and gastronomic heritage.

Quality schemes can benefit the rural and coastal economy. This is particularly the case in disadvantaged areas, in mountain areas and in the most remote regions where the farming sector already takes a significant part of the economy and production costs are high. They can create value for local communities through products that are deeply rooted in tradition, culture and geography.³⁹¹

Building on the state-of-the-art in particular, but not limited to, on results of the Strength2Food project³⁹², the proposals are expected to focus on GIs schemes.

Proposals are expected to:

- Provide a sound analysis of the state-of the art in research on the impacts of GIs schemes in terms of all aspects of sustainability;

³⁹⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

³⁹¹ https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/cap-specific-objectives-brief-3-farmer-position-in-value-chains_en.pdf

³⁹² <https://www.strength2food.eu/>

- Assess sustainability impacts of all GIs products (>3000) in all three dimensions, i.e., economic, social and environmental (including use of natural resources, cultural heritage preservation, public health);
- Comprehensively map the practices in GIs production systems and identify those that minimise the negative environmental and social impacts and at the same time balance the economic dimension of sustainability;
- Investigate how to better valorise the sustainable deliverables of GIs, including the type and characteristics of public goods generated by the GI production and the benefits for local areas and society at large;
- Identify synergies among different intervention schemes in order to increase the participation of farmers and fishermen;
- Explore consumers’ perception of GIs, including the demand for valorising GIs as a qualifier of shorter food supply chain, and how to better promote GIs that are aligned with healthy and sustainable diets to increase demand and willingness to pay for GI products.
- Explore and benchmark the approaches/policy followed by the different Member States and Associated Countries when it comes to GIs and sustainability;
- Formulate best practices, decision tools, recommendations to be used by producers and policy makers to improve sustainability of the GIs schemes and optimise the support for newly established GI schemes that are aligned with healthy and sustainable diets;

An adequate representation of consumers’ interests by bodies that are knowledgeable of policy issues involved needs to be ensured, at least for those aspects of the project that involve consumers, consumers’ information and perception.

HORIZON-CL6-2023-COMMUNITIES-01-5: Assessing urban farming impacts

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: The successful proposals will support the European Green Deal, farm to fork strategy and impact assessment for the post-2027 common agricultural policy (CAP).

Projects results are expected to contribute to all of following expected outcomes:

- Improved knowledge on impacts and risks of various types of urban farming from the economic, environmental and social perspective, with a particular focus on spill-over effects into rural and peri-urban areas;
- Improved awareness of policy makers helping them adjust policy and legal frameworks to foster benefits and mitigate risks associated to the development of various forms of urban farming and related technologies.

Scope: Proposals are expected to:

- Assess current and future (foresight) contribution of various forms of urban farming to:
 - o Overall food supply, food security and resilience mainly for urban citizens but also addressing potential food security impacts on rural populations, factoring in megatrends and potential risks around key inputs or conditions enabling urban farming;
 - o Evolution of farm income in urban and rural areas, the distribution of value added in the supply chain and possible effects on the bargaining power of supply chain actors;
 - o The provision of ecosystem services in urban and rural areas against the evolution of environment and climate conditions (including water and nutrient use and cycling, biodiversity protection, energy use, soils including soil health, regulation of the urban heat island effect etc.), in relation with European Green Deal objectives;
 - o The provision of social benefits (e.g., access of new and/or young farmers, gender equity, place-based/community development) and improvement of social capital (e.g., values, networks, governance) and community cohesion in urban and rural areas. Social Sciences and Humanities (SSH) aspects should be an integral part of the proposal;
 - o The demand for new skills, training and educational offer also taking into account the technological or social dimensions of different forms of urban farming.
- Compare the conditions under which various types of urban, peri-urban or rural farmers operate in order to identify the challenges that may justify targeted regulatory or policy initiatives. Conditions are to be understood in a broad sense, including e.g., initial investments, production, quality control, labelling, marketing and retail as well as the legal and enabling environment in which they operate.
- Support the discussion on rationale for policy interventions in the EU context.

Proposals should build links and capitalise on the results of past and ongoing relevant projects, e.g., Horizon 2020 EFUA and the New European Bauhaus (NEB) in urban food system transformation.

Proposals should describe a credible pathway from their project results and outcomes towards the expected impact of this Destination.

HORIZON-CL6-2023-COMMUNITIES-01-6: Inclusive and smart ways to communicate sustainability of food

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.50 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>

Expected Outcome: This topic is in line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050. This will contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities and thriving businesses.

This topic contributes to creating a sustainable food labelling framework to empower consumers to make sustainable food choices as part of the farm to fork strategy.

Projects results are expected to contribute to all the following expected outcomes:

- Enhanced understanding of the status of consumer information expectations/needs (conscious and unconscious) related to all three dimensions of sustainability and its drivers and challenges, including the influence of external factors and socio-cultural aspects;
- Identified best means of transmission and presentations of sustainability related information to guide and change consumer behaviour.

Scope: The sustainability food labelling framework can help consumers in making sustainable food choices. An improved understanding of the drivers of food choices and the role of sustainability can support in using EU and national policy makers and government actions and

funds most efficiently and using the best approaches³⁹³. Information itself may not be enough to change citizens' perception and actions, it should be addressed "in the right way" (emotional cues...etc.) and consider their current knowledge and information needs. Citizens' food choices, although frequently characterized as a matter of personal choice, are subjective largely by food environments³⁹⁴ and there is a need to understand the influence of marketing and media as part of the environment, sometimes creating adverse effects³⁹⁵.

Proposals are expected to address the following:

- Analyse the impact of different influential factors, such as norms/beliefs/cultural environments as well as medias and their way of communicating on the consumer understanding of sustainability, emotional beliefs and response to sustainability information including issues of trust and reliability;
- Analyse the status of consumer information expectations/needs (conscious and unconscious) related to sustainability and understand how sustainability related information expectations/needs can be increased/developed as well as their drivers and challenges;
- Test different means of transmission (including different actors sharing information (private vs public)) and presentations of sustainability related information to guide and change consumer behaviour best (including increased willingness to pay for sustainable products and services);
- Test the response of the public to information related to at least two dimensions of sustainability, including aspects that cover the whole food chain, such as for example biodiversity, packaging or composting, locally produced products;
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects under the topic HORIZON-CL6-2024-GOVERNANCE-01-3: The role of mainstream media, social media and marketing in fostering healthy and sustainable consumption patterns and how to encourage good practice or incentives”;

Proposals are encouraged to cooperate with actors such as the European Commission's Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.

³⁹³ Placzek, O., "Socio-economic and demographic aspects of food security and nutrition", OECD Food, Agriculture and Fisheries Papers, No. 150, OECD Publishing, Paris, <https://doi.org/10.1787/49d7059f-en>, 2021.

³⁹⁴ European Public Health Alliance (2019) "Food environments are the physical, economic, political and socio-cultural contexts in which people engage with the food system to make their decisions about acquiring, preparing and consuming food" at <https://epha.org/what-are-food-environments/>.

³⁹⁵ World Health Organisation "Tackling food marketing to children in a digital world: trans-disciplinary perspectives", https://www.euro.who.int/_data/assets/pdf_file/0017/322226/Tackling-food-marketing-children-digital-world-trans-disciplinary-perspectives-en.pdf, 2016.

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of citizens and civil society, together with social innovators, planners, social scientists, communication and marketing experts and public authorities to develop new methods and approaches to innovation. This topic should involve the effective contribution of SSH disciplines.

Call - Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2024-COMMUNITIES-01

Conditions for the Call

Indicative budget(s)³⁹⁶

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ³⁹⁷	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024				
HORIZON-CL6-2024-COMMUNITIES-01-1	IA	6.00	Around 3.00	2
HORIZON-CL6-2024-COMMUNITIES-01-2	RIA	6.00	Around 6.00	1
HORIZON-CL6-2024-COMMUNITIES-01-3	RIA	3.00	Around 3.00	1
Overall indicative budget		15.00		

General conditions relating to this call

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

³⁹⁶ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

³⁹⁷ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-COMMUNITIES-01-1: Unlock the potential of the New European Bauhaus in urban food system transformation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Evaluation Procedure</i>	To ensure a balanced portfolio covering demonstration activities in diverse geographical areas of the European Union and Associated Countries, grants will be awarded first to the highest ranked application according to the standard procedure described in Horizon Europe General Annexes D and F, followed by other applications that are the highest ranked among those that ensure the most complementary geographical coverage, provided that the applications attain all thresholds. When assessing geographical coverage, the evaluation will take into account the location of the application's demonstration activities, not the location of the application's

	participants/beneficiaries.
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Expected Outcome: In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as of the EU's climate ambition for 2030 and 2050 and the EU biodiversity strategy for 2030, the successful proposal will support the development of policies, business models and market conditions contributing to the sustainable, balanced and inclusive development of urban and peri-urban areas and to the empowerment and resilience of their communities, who can access, afford and choose healthier, nutritious and environmental-friendly food. The successful proposal will also contribute to the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities.

The overall aim of this topic and associated R&I activities is to leverage the New European Bauhaus³⁹⁸ values for urban and peri-urban food system transformation by positively transforming the food environment³⁹⁹ to enable sustainable, inclusive, and aesthetic ways of food system transformation.

Projects results are expected to contribute to all following expected outcomes:

- Positively transformed food environments that enhance sustainable food system transformation by applying the vision of New European Bauhaus (NEB) to “call on all Europeans to imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls”;
- Reconnected and engaged citizens with nature and healthy and sustainable food for their well-being and health while providing multifunctional benefits, such as biodiversity.

Scope: Sustainable food systems can be an integral part of our living spaces including urban gardens, rooftop gardens and other nature-based solutions and positively transform our food environments. Exploiting the vision of New European Bauhaus and providing inclusive access, education and capacity building can provide multi-functional benefits and help transforming food systems especially in urban and peri-urban areas.

Proposals are expected to address the following:

- Involve all three core values of NEB: 1) sustainability, 2) aesthetics/quality of experience, 3) inclusion, for transforming food environments and contribute to a green and sustainable infrastructure;
- Expand food environments by using architecture/local place-based approaches for innovative solutions, including art, for current and future needs linked to sustainable food environments and stronger citizen connection to food and empowered self-

³⁹⁸ https://europa.eu/new-european-bauhaus/index_en

³⁹⁹ European Public Health Alliance (2019) “Food environments are the physical, economic, political and socio-cultural contexts in which people engage with the food system to make their decisions about acquiring, preparing and consuming food.” <https://epha.org/what-are-food-environments/>

provisioning communities with multi-functional nature-based solutions (e.g., urban gardens connected to parks, edible trees and bushes, edible green infrastructure...etc.);

- Use and demonstrate place-based solutions with considering its specific resource pool and place, e.g., connect food to local cultural values and if possible, to indigenous communities and/or urban citizens' movements and make use of local plants and herbs, also supporting local ecological resilience;
- Apply and demonstrate community-based solutions with strong citizen engagement (especially youth) to simultaneously drive human needs and environmental benefits;
- Connect rural and urban/peri-urban areas and communities for co-benefits and enhanced inclusive experience, by also using data and technology⁶;
- Develop appropriate models to multiply innovations across the EU while considering different types of urban/peri-urban areas (different city size, different countries);
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic as well as to interact with the New European Bauhaus community, NEBLab and other relevant actions under NEB, e.g. by participating in activities, workshops, as well as common communication and dissemination activities, and connect with learnings from other initiatives such as the “Year of Greener Cities” and “Year of youth”;

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of citizens and civil society, together with urban designers, design thinkers, social innovators, start-ups, planners, social scientists and public authorities to strengthen relationships between urban planning and food choices and to develop new methods and approaches to innovation. This topic should involve the effective contribution of SSH disciplines.

In the context of this topic, geographical areas of the European Union and Associated Countries are NUTS level 1 regions of European Union Member States and of Associated Countries for which they are defined. In the case of Associated Countries without NUTS classification, the country as a whole is to be considered as one geographical area:

- List of Associated Countries not defined by NUTS level 1: Armenia; Bosnia and Herzegovina; Faroe Islands; Georgia; Kosovo⁴⁰⁰; Israel; Moldova; Tunisia; Ukraine.
- List of countries not defined by NUTS level 1 with which association negotiations are being processed or where association is imminent: Morocco.

⁴⁰⁰ This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

HORIZON-CL6-2024-COMMUNITIES-01-2: Societal perceptions and benefits of rural life and jobs: will COVID 19 generate a long-lasting shift?

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: The successful proposal will contribute to fostering a sustainable, balanced, equitable and inclusive development of rural areas, supporting the implementation of the long-term vision for the EU’s rural areas⁴⁰¹ and its objectives that sees EU rural areas stronger, connected, resilient and prosperous by 2040, and the EU territorial agenda for 2030⁴⁰².

Project results are expected to contribute to all of following expected outcomes:

- Improved understanding by policy makers at different levels (European, national, regional and local) of the behavioural drivers of people’s lifestyle choices and rural and urban dwellers’ perceptions of rural life in the aftermath of COVID 19;
- Improve understanding of policy makers at different levels (European, national, regional and local) of the behavioural and structural drivers of people’s lifestyle choices and people’s perceptions of rural life in the aftermath of COVID 19 and of the long-term trends and opportunities for rural areas;
- Improved policy-response to rural areas challenges and needs in the light of the COVID 19 impact;

Improved narrative of rural and farming lives.

Scope: Rural areas are often described by the challenges they face: depopulation, demographic change, low income levels, limited access to services, low connectivity, discontent caused by the feeling of being overlooked and limited resilience. However, rural areas can be places of opportunities⁴⁰³. For instance, they are key for green-energy production and for ecosystem services; they have the potential of developing the bio and circular economy; they are also an integral part of the ecological and digital transitions; they can also

⁴⁰¹ A long-term vision for the EU’s rural areas - Towards stronger, connected, resilient and prosperous rural areas by 2040, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0345>

⁴⁰² Territorial Agenda 2030, https://ec.europa.eu/regional_policy/sources/docgener/brochure/territorial_agenda_2030_en.pdf

⁴⁰³ OECD, Rural well-being, geography of opportunities, <https://www.oecd.org/regional/rural-well-being-d25cef80-en.htm>

be places rich in terms of cultural heritage and have the potential to develop cultural initiatives.

Overall, there are increasing demands from the society that are putting pressure on rural areas and the Covid-19 crisis showed how important it is to keep essential services, e.g. the agri-food production that is an important part of the rural economies, active.

To better respond to rural areas needs and challenges, and to revert the negative trends that affect the well-being of rural communities, it is important to better understand how rural life is perceived by urban and rural dwellers and to build a new narrative, based on facts, that highlight the opportunities of these places.

Projects funded under this topic are expected to:

- undertake sociological, behavioural, social psychology, social science, history, geographical, cultural, gender, economic studies on societal perception of rural areas and rural lifestyles, including, but not limiting to, societal perception of farming in a variety of places across Europe;
- increase understanding of the drivers of the attractiveness of rural and farming lives and of corresponding criticisms and biases, including the social composition of flows (e.g. age, gender, nationality, economic status, etc.), a geography of departure and destination zones, distinguishing between perceptions and facts, and both from rural people and urban people (including perception of various farming sectors and practices);
- analyse how these drivers have been affected by COVID 19 and are likely to evolve, in the short to long-term (2050) (e.g. economic and trade evolution, new ways of working, multi-local living and second homes, zero pollution, health risks etc.);
- analyse social relations and possible conflicts between new populations and residents, the possible decomposition of social segregation or social mixing;
- identify the policy and financial consequences for local jurisdictions of both new arrivals and depopulation in terms for instance, of public infrastructures sizing (e.g., water treatment, waste management), real estate markets and housing, public services, etc.
- analyse initiatives aiming at shifting perceptions of both urban and rural dwellers on rural and farming lives and pilot new initiatives (e.g. on rural attractiveness for young people also beyond agriculture) in different localities across Europe;
- use foresight (e.g., scenarios, build on trend analysis and disruptive factors, weak signals) to develop adequate strategies to mitigate threats and seize opportunities;
- contribute to build a positive narrative of rural and farming lives based on facts.

This topic should involve the effective contribution of social science and humanities (SSH) disciplines (e.g., sociology, history, human geography behavioural sciences, gender studies, etc.).

HORIZON-CL6-2024-COMMUNITIES-01-3: Participation and empowerment of Arctic coastal, local, and indigenous communities in environmental decision-making

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: the proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁰⁴ .

Expected Outcome: Proposals should contribute to the sustainable and inclusive development of Arctic coastal, local and indigenous communities, supporting the implementation of the European Green Deal and the EU policy for a peaceful, sustainable and prosperous Arctic, incorporating a better understanding of the environmental, socio-economic, cultural and demographic drivers of change in the Arctic region.

Activities are expected to empower Arctic coastal, local and indigenous people to act for change through capacity building and education actions, leading to positive long-term prospects for all, including women, young people and vulnerable groups.

The research should explore and document traditional environmental knowledge (TEK) of Arctic coastal, local and indigenous peoples, contributing thus to safeguarding and valuing the cultural identity of the Arctic; explore interactions between local and indigenous knowledge

⁴⁰⁴ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

holders and scientists and develop innovative ways to mobilise this knowledge for climate change adaptation, ecosystem restoration and socio-economic goals.

Project results are expected to contribute to the following expected outcomes:

- Better understanding of how different types of knowledge, including traditional environmental knowledge (TEK)⁴⁰⁵, are being mobilised; how scientists and local and indigenous knowledge holders cooperate and dialogue in this context;
- Empowerment of Arctic coastal, local and indigenous people and sectors to innovate⁴⁰⁶ for the ecological transition and feel part of it, through participatory methodologies (i.e. a multi-actor approach); to engage in decision-making about their environment and livelihoods;
- Explore, with different actors, and recommend ways to bring traditional, local, and scientific knowledge into the collective effort of solving matters of concern, including (choose at least 2 from the items below):

-Adaptation and mitigation to climate change, ecosystem restoration and environment protection;

-Socio-economic changes in the Arctic, ranging from local level (subsistence economies, local livelihoods) to circular economy, fishing, international trade, shipping routes, tourism, and the socio-economic impact of climate change;

-Health and well-being, taking a One Health approach⁴⁰⁷;

-Gender aspects, in the context of current economic and social development and future challenges, inter alia relating to climate and environmental issues.

Scope: Addressing ongoing Arctic environmental and societal changes requires that all relevant knowledge, indigenous/traditional and scientific knowledge alike, is mobilised to respond and govern the challenges posed by those changes, and communities empowered to take part in environmental decision-making.

Proposals are expected to contribute to sustainable and inclusive development, incorporating a better understanding of the environmental, socio-economic, cultural and demographic drivers of change. They will investigate the participation of indigenous and local communities in the

⁴⁰⁵ A definition is proposed in the JRC Report, Arctic Knowledge: Echoes from the North, European Commission, 2021: Traditional/indigenous/local knowledge refers to the knowledge owned by indigenous and local people and communities. It is a living and dynamic knowledge focused on interconnections in the ecosystem. The knowledge is based on a holistic approach and is systematically resilient. Its practice is closely related to land and sea and the lived experience in an environment. It has its own validation methods which are constantly evolving over generations, within communities and families. It is embedded in cultural upbringings and framed within particular worldviews which shape interactions with the environment, all living beings and the management of resources.

⁴⁰⁶ More on social innovation can be found here: www.siceurope.eu

⁴⁰⁷ The term “One Health” describes a multidisciplinary approach to health risks in humans, animals, plants, and the environment.

governance of their livelihoods and environmental decision-making. Proposals should explore how different ways of knowing, worldviews and perspectives can be brought in dialogue, to enhance understanding and to better respond to the impacts of climate, environmental and related socio-economic changes on Arctic people's livelihoods and the environment. Furthermore, how coastal, local, and indigenous communities could be empowered via participatory research processes, to get involved in environmental decision-making. Proposals should identify opportunities for partnerships and co-production of knowledge based on indigenous and scientific ways of knowing.

Proposals should explore how different ways of knowing, worldviews and perspectives can be brought in dialogue, to enhance understanding and to better respond to the impacts of climate, environmental and related socio-economic changes on Arctic people's livelihoods and the environment. Furthermore, how coastal, local, and indigenous communities could be empowered via participatory research processes, to get involved in environmental decision-making. Proposals should identify opportunities for partnerships and co-production of knowledge based on indigenous and scientific ways of knowing.

Several potential coastal sectors can be addressed, however the proposal will ensure inclusion of marine protection, food security, climate adaptation and resilience strategies, but also other activities such as leisure activities and eco-socio-compatible tourism development in coastal areas.

Projects should include representation from multiple disciplines of research, including environmental, marine, social, cultural, health, design.

Attention should be given to different capacity building and social learning arrangements as well as to innovative governance mechanisms at various levels, and their potential implications for social innovation.

This topic is expected to involve the effective contribution of SSH disciplines. The proposals should adopt a responsible and solidary approach where Arctic local and indigenous communities are seen as research partners, using participatory methods and bottom-up co-creation. Participation of Arctic indigenous partners in the project is encouraged, to be involved from the outset in the co-development of the research proposal. Engaging with local authorities during the project would help increase implementation of the project outcomes and support further uptake.

Projects should build on existing knowledge and integrate results from multiple origins, including other EU, international or national projects. Some cooperation activities with projects financed under Destination 'Biodiversity and ecosystem services' and topics of the European Green Deal Call could be included, as well as with relevant projects from other EU programmes, for example the Horizon Europe Missions Ocean, seas and waters and Adaptation to Climate Change.

International cooperation is encouraged, with a strong linkage with the ongoing activities under the All-Atlantic Ocean Research and Innovation Alliance and encouraging participation from countries that take part in the Arctic Science Ministerial meetings.

Call - Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2024-COMMUNITIES-02

Conditions for the Call

Indicative budget(s)⁴⁰⁸

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁴⁰⁹	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 22 Feb 2024 (First Stage), 17 Sep 2024 (Second Stage)				
HORIZON-CL6-2024-COMMUNITIES-02-1-two-stage	IA	10.00	Around 5.00	2
HORIZON-CL6-2024-COMMUNITIES-02-2-two-stage	RIA	12.00	Around 6.00	2
Overall indicative budget		22.00		

General conditions relating to this call

<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and</i>	The criteria are described in General Annex

⁴⁰⁸ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

⁴⁰⁹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>exclusion</i>	C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-COMMUNITIES-02-1-two-stage: Innovating for climate-neutral rural communities by 2050

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See the definition of the multi-actor approach in the introduction to this work programme part.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: This topic is part of the blind evaluation pilot under which first stage

	proposals will be evaluated blindly.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴¹⁰ .

Expected Outcome: The successful proposal will contribute to fostering a sustainable, balanced, equitable and inclusive development of rural areas, supporting the implementation of the long-term vision for the EU’s rural areas and its objectives (in particular contributing to stronger and resilient rural areas) and to its flagship initiative “Research and innovation for rural communities”, the European Green Deal, in particular the climate pact, the fit for 55 package, the forest and biodiversity strategies, and the new soil strategy as well as the territorial agenda 2030, the common agricultural policy (CAP) and the REPowerEU plan. In addition, proposals will complement the EU Mission Climate-Neutral and Smart Cities, covering sparsely populated areas, and contribute to the objectives of the EU Mission ‘A Soil Deal for Europe’.

Project results are expected to contribute to all of following expected outcomes:

- rural communities are empowered and engaged in the green transition and equipped with strategies and innovative solutions to contribute to EU’s climate-neutrality objectives (by 2035 and 2050) and benefit from a climate-neutral economy;
- rural communities take advantage of data, interoperable platforms and digital technologies available to help them meet climate-neutrality objectives, such as dashboards, data visualisation techniques, modelling, digital twins of entire rural communities and tools contributing to spatial planning;
- policy makers are better informed about policy and regulatory frameworks, conditions and processes that are likely to encourage rural areas’ climate-neutrality while sustaining an adequate social welfare and well-being and avoiding negative social, economic and environmental externalities;
- a stronger rural innovation ecosystem is in place bringing together public and private players and making rural areas an attractive place for innovators to work and live.

⁴¹⁰ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Scope: The EU aims to be climate-neutral by 2050 – an economy with net-zero greenhouse gas emissions. This objective is in line with the EU’s commitment to global climate action under the Paris Agreement and it is reflected in the European Green Deal objectives. Considering that approximately one third of EU citizens live in rural areas, which represent 83% of the EU territory, it is key to empower rural communities to transit towards sustainability by fostering innovation in key areas such as environment and sustainable management of resources (air, soil, water), energy, transport, agriculture, industry, bioeconomy, and finance and ensure that no one is left behind.

Projects funded under this topic are expected to:

- design, prototype and test concrete innovations (technical, social, organisational) supporting climate-neutrality, zero pollution and biodiversity enhancement in rural communities, possibly including initiatives such as nature-based solutions (NBS), circularity and bioeconomy, bio-based solutions, community-energy systems, climate-neutral mobility, fire-prevention, etc. Innovations should be co-created with rural stakeholders to respond to their needs and tested for their feasibility for the territorial development opportunities or drawbacks that they bring;
- include training and capacity building for local administrations and rural stakeholders in order to create and maintain a rural innovation ecosystem and enable them to make use or benefit from the successful innovations developed and from existing funding opportunities for the green and digital transitions;
- boost networking and enhance peer-to-peer learning between communities and capitalise on lessons learnt making them available as recommendations for policy makers at various levels (European, national, regional and local);

Proposals are encouraged to fully exploit and build complementarities with the ongoing work regarding the establishment of the European Open Science Cloud and interact with relevant projects developing metadata standards and added value tools to ensure interoperability within and across fields of study.

This topic should involve the effective contribution of social sciences and humanities (SSH), (e.g., for expertise in behavioural change, etc.) and must implement the multi-actor approach by involving relevant stakeholders from an early stage (e.g. rural communities representatives, small-medium enterprises -SMEs, etc., end-users, local authorities, etc.).

Proposals should cover various biogeographical regions with a balanced coverage reflecting the various pedo-climatic zones in Europe in a representative way.

Proposals are expected to build on the preliminary results of the Horizon Europe projects GRANULAR and RUSTIK, in particular its framework and indicators on climate-neutrality of rural communities.

Proposals should also create synergies and coordinate activities with the other project funded under this topic and should allocate appropriate budget for this task. Proposals are also encouraged to build synergies with relevant projects that will be financed under this call.

HORIZON-CL6-2024-COMMUNITIES-02-2-two-stage: New sustainable business and production models for farmers and rural communities

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 12.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Admissibility conditions</i>	The conditions are described in General Annex A. The following exceptions apply: Applicants submitting a proposal under the blind evaluation pilot (see General Annex F) must not disclose their organisation names, acronyms, logos, nor names of personnel in Part B of their first stage application (see General Annex E).
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See the definition of the multi-actor approach in the introduction to this work programme part.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: Proposals are expected to clearly address only one of the areas: area A or area B. To ensure a balanced portfolio covering both area A and area B, grants will be awarded to applications not only in order of ranking but at least also to one project that is the highest ranked within area A or B, provided that the applications attain all thresholds. This will allow to fund at least one project under area A and one under area B. This topic is part of the blind evaluation pilot under which first stage proposals will be evaluated blindly.

Expected Outcome: The successful proposal should support the European Green Deal initiatives notably the farm to fork, the forest, biodiversity and bioeconomy strategies, the common agricultural policy (CAP), the communication on sustainable carbon cycles, the EU

mission “A Soil Deal for Europe”, and the long-term vision for the EU’s rural areas (contributing to make rural areas stronger, connected, resilient and prosperous) and its research and innovation flagship initiative by developing innovative business and production models (i.e. but not limited to, smart farming, social farming, indoor plant factory, aquaponics, unattended horticulture, livestock and fish farms, e-commerce, tourism, cultural and natural heritage management, service delivery) that are fit for the future and foster improved economic outcomes, cooperation, inclusiveness and fairness for farmers and/or rural communities, and at the same time achieve high sustainability, contribute to climate neutrality and meet societal expectations, in particular with regards to local economies and protection and restoration of nature and resources (e.g. water, soil and air).

Project results are expected to contribute to all of the following expected outcomes:

- Farmers and/or other rural actors widely adopt innovative inclusive and sustainable business and production models that enhance and remunerate climate action (i.e. increase carbon removals), biodiversity protection and restoration, and the reduction of emissions or concentrations of air pollutants in a variety of farming and rural contexts;
- Farmers and/or rural actors position in value chains is improved thanks to more inclusiveness, fairness and financial sustainability of trading relationships between the various actors in the upstream/downstream agri and rural business;
- It is possible to measure and track the economic, social and environmental sustainability of different farming systems and rural businesses thanks to the development and use of innovative technologies, including but not limiting to digital ones.
- Increased prosperity of farmers and/or in rural areas thanks to the creation of new jobs opportunities resulted from innovative and sustainable production and business models.

Scope: EU agri-food value chains are diverse and dynamic, enabling them to meet the various consumers’ expectations, potentially helping producers increase value added. Farming and other sectors in rural areas provide large numbers of jobs, yet rural communities often face challenges, such as a shrinking and ageing population, a lack of high qualified workers, a lack of good quality services and connectivity, which limit the economic attractiveness of these places.

At the same time agriculture is characterised by a stagnant and low share of value added in the value chain due to: high input costs, structure of the food value chains (concentration upstream and downstream), variation in production and incorporation of new services. Pressure on natural resources and climate change threats make all of the above-mentioned problems weigh more heavily. In an era of very tense discussions on climate change, global warming, air, water and soil pollution the EU stands firmly as a front-runner and targets the very ambitious goal of becoming a climate-neutral continent by 2050. This target seems very

challenging when looking at where we stand today and the pace at which expected changes across different sectors are taking place.⁴¹¹

Therefore, rural communities as well as farmers are under increasing pressure to adopt sustainable business and production models that consider not only economic but also both social and environmental aspects. Moving towards more sustainable business and production systems requires adequate tools and measurement methods to assess and monitor the multi-performance of farms and rural businesses under different conditions.

Successful proposals are expected to clearly address only one of the following areas: area A or area B.

Area A

Proposals should:

- Design, test and upscale bottom-up community-led innovative business, cooperation and production models to improve farmers' position in different value chains and enable them to transition to sustainable agriculture and answer global challenges in locally adapted ways. They should cover a wide diversity of pedoclimatic, technical, organisational and economic conditions, including the complexity and dynamics in various production systems and structure of food value chains (additional sustainability requirements for farmers might lead to further unbalances in market power in the food chain).
- Investigate ways to monitor and verify improved social, environmental and climate performance and translate it into economic profit and competitive advantage for farmers. They should consider existing, emerging and potential markets and platforms, take into consideration sound cost-effective business, cooperation among different actors and production methods, sustainability and profitability.
- Investigate the trends in adoption of innovation in farms and how farmers innovate their business, cooperation or production models when they introduce new products and engage in new business activities.

Aim to connect citizens, private companies and public organisations with farmers to increase demand for sustainable agriculture and create a market for new business, cooperation and production models including for, but not limited to, e-commerce, smart farming, indoor plant factory, aquaponics, unattended horticulture, livestock and fish farms. Traceability for products and standards for safety and quality should also be taken into account.

- Create and widely share via an open access platform practical innovations, tools, best practices and guidelines to successfully develop and implement novel inclusive and sustainable business, cooperation and production models.

⁴¹¹ https://eic.ec.europa.eu/documents-0_en#ecl-inpage-1107

- Investigate and support the wide-spread applications of highly scalable business models for modern agricultural purposes including aspects of platform, circular and bio-based economies.
- Consideration should be given to innovative approaches in the development of production technologies, the circularity of the processes with the objective of zero waste, cascading of resources and consider public health as well as consumers' concerns and demands.

Area B

Proposals are expected to:

- Pilot innovative sustainable business and cooperation models to foster wealth and well-being of rural communities and villages while taking advantage of the green transition through the deployment of demonstrators. These demonstrators should be implemented in various sectors (i.e. but not limited to energy, transport, social services, tourism, culture, digital, etc.) responding to rural communities' needs.
- Investigate the potential of social economy, cooperatives (or other producer organisations) and of innovative forms of business aggregation and develop at least one of these demonstrators that support local economy by actively involving people in a vulnerable situation.
- Explore and take advantage of cross-sectoral and cross-territory linkages adopting a territorial perspective that aims at improving connectivity of rural areas with surrounding intermediate and urban areas.
- Examine the impacts of different kind of innovation on the development and revitalisation of rural areas and the quality of life and living standards of their residents.
- Identify barriers, as well as drivers (including policies) and enabling conditions for the creation and development of sustainable business models in rural areas.
- Provide recommendations to policy makers, at the local, regional, national and international levels for supporting the creation of sustainable business models fit for the future with the aim to increase quality public services, to make better use of various resources and reduce negative impact on the environment, and that provide new opportunities for rural value chains through different models of innovation.
- Create and widely share via an open access platform practical innovations, tools, best practices and guidelines to successfully develop and implement novel inclusive and sustainable business models.
- Proposals should cover a representative variety of rural areas.

All proposals (independent of the selected focus A or B) should explore social innovation and innovative forms of cooperation. Proposals must implement the 'multi-actor approach' and ensure adequate involvement of relevant actors of the value chain.

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines. Proposals should build on previous and ongoing Horizon 2020 relevant projects (i.e. but not limited to SMARTCHAIN, NEWBIE, agroBRIDGES, CO-FRESH, RUBIZMO, LIVERUR, etc.). They should include a dedicated task, appropriate resources and a plan on how they will collaborate with the other project funded under this and other relevant topics in Horizon Europe and ensure synergy with relevant activities carried out under other initiatives (i.e. but not limited to EIT Knowledge and Innovation Communities, Enterprise Europe Network, Circular Bio-based Europe public-private partnership, etc.).

Beyond open access to scientific publications and research data, open access to software, models, workflows, etc. is required to ensure accelerated uptake of innovation, increase research transparency, support immediate and extensive re-use of research materials, and support collaborative and interdisciplinary work, among others.

Due to the scope of this topic, international cooperation is strongly encouraged, in particular with China. This topic is within the scope of the Administrative Arrangement between the European Commission and the Ministry of Science and Technology of the People's Republic of China on a Co-funding Mechanism for the period 2021-2024 to support collaborative research projects under the Food, Agriculture and Biotechnologies (FAB) and the Climate Change and Biodiversity (CCB) flagship initiatives.

Actions will contribute to implementing the EU-China Food, Agriculture and Biotechnology (FAB) flagship initiative, which aims to ensure sustainability of agri-food systems, catering for the needs of a growing population, the reduction of food and agricultural losses and waste, and the provision of safe and healthy foodstuffs. Interaction with other actions developed under the EU-China Climate Change and Biodiversity (CCB) Research Flagship and the Flagship on Food, Agriculture and Biotechnologies (FAB) is encouraged if relevant.

Destination - Innovative governance, environmental observations and digital solutions in support of the Green Deal

Taking advantage of the use, uptake, and deployment of environmental observations as well as digital and data-based green solutions, assessed through the European Green Deal's 'do no harm' principle, is key for innovative governance models and for designing, implementing and monitoring science-based policy. To maximise impacts of R&I on the ground and spark behavioural and socio-economic change, the knowledge and innovation produced throughout the whole cluster should be widely disseminated to and exchanged between the key stakeholders and end users. In particular, the Agricultural Knowledge and Innovation Systems (AKIS) need to be strengthened in line with the 2023-2027 CAP to accelerate the required transformative changes.

Innovating with governance models and supporting policies

Transformative changes such as those required within the European Green Deal are dynamic processes that require appropriate governance. At the same time, to ensure coordination and for collaborative and informed decision-making, governance requires multiple channels and networks that provide readily available and robust data and information from different sources.

R&I activities under this destination aim to both: experiment with new ways to govern the transition process and strengthen the governance, in particular by ensuring i) appropriate and inclusive engagement with stakeholders, e.g. civil society and regional and local actors, ii) environmental observations coverage, and iii) that information and knowledge is made available and accessible. R&I for governance to support the European Green Deal should provide insights into the opportunities to overcome potential institutional barriers such as lock-ins, path dependency, political and cultural inertia, power imbalances and the ways to strengthen the effectiveness and efficiency of regulatory pathways. It should also help create synergies and linkages between different policy instruments and funding opportunities.

Innovative governance supporting the European Green Deal objectives needs to recognise, cope with and promote resilience and inclusiveness in the face of on-going shocks and disruptions across Europe and the world, whether these be climatic, ecological, economic, social, geopolitical or related to agricultural inputs and resources, food, health, bio-based sectors or the wider bioeconomy. The creation of networks with the public (citizen engagement) and researchers, including also through digital technologies, can step up transformation and enhance resilience in different areas, such as food. Critical risk assessment and reduction strategies need to be incorporated, including the diversification of infrastructures, resources and knowledge through more self-sufficiency and autonomy. Innovative governance will: i) support social innovation in the bioeconomy and bio-based systems (e.g. revitalisation of local communities with innovative bio-based business models and social innovation, or with co-creation and trust-building measures for biotechnology and bio-based innovation systems); ii) assess existing and emerging trade-offs of land and

biomass; and iii) strengthen the national bioeconomy networks in countries taking part in the Central-Eastern European Initiative for Knowledge-Based Agriculture, Aquaculture and Forestry in the Bioeconomy (BIOEAST Initiative)⁴¹².

The new **partnership ‘Agriculture of Data’** will help improve the sustainability performance of agricultural production and strengthen policy monitoring and evaluation capacities through using the full potential of Earth and environmental observation and data technologies. It will address public and private sector interests in a synergetic way. This will be done through responsible R&I delivering data-based green solutions and through establishing governance structures which allow for systemic approaches to capitalising and using data. The **partnership for a ‘Climate-neutral, sustainable and productive Blue Economy’** will enable a just and inclusive transition to a climate-neutral, sustainable and productive blue economy providing for a healthy ocean, people’s wellbeing, and a blue economy that is in harmony with nature and whose benefits are distributed fairly.

Deploying and adding value to environmental observations

Data and information obtained through environmental observation is of great value when assessing the state of the planet and is crucial to supporting the European Green Deal and the climate and ecological transitions. Integrating this information from different sources (space-based, airborne including drones, in-situ and citizens observations) with other relevant data and knowledge while ensuring (better) accessible, interoperable or deployable information, provides the information necessary for shaping the direction of policy development in the broad context of Cluster 6A strong link to Copernicus, the European Earth observation and monitoring part of the EU Space programme (in Cluster 4 - Digital, Industry and Space) and the European Space Agency’s (ESA) Earth observation programme, as well as support to the Group on Earth Observation (GEO), its European regional initiative (EuroGEO), the Global Earth Observation System of Systems (GEOSS) and the European Commission initiative *DestinationEarth*⁴¹³, is foreseen for topics on environmental observations under this destination. R&I activities relevant to the ocean, seas and coastal waters will complement and support the UN Decade of Ocean Science for Sustainable Development and the UN Decade on Ecosystem Restoration, the G7 Future of the Seas and Oceans Initiative, the European Global Ocean Observing System (EOOS) and the GOOS 2030 strategy.

Digital and data technologies as key enablers

Digital and data-based innovation, in complementarity with activities supported by Cluster 4 and the Digital Europe Programme, should bring benefits for citizens, businesses, researchers, the environment, society at large and policymakers. The potential of the ongoing digital transformation, and its wider impacts – both positive and negative – need to be better understood and monitored in view of future policy design and implementation, governance, and solution development. The potential for digital and data technologies, including AI-, IoT-, and augmented reality-based solutions, to increase the sustainability and resilience of

⁴¹² <https://bioeast.eu/>.

⁴¹³ <https://digital-strategy.ec.europa.eu/en/policies/destination-earth>.

production and consumption systems, as well as industry and services, in sectors covered by this Cluster will be exploited. This destination will contribute to the development, support and take up of innovative digital and data-based solutions to support communities, economic sectors relevant for this cluster and society at large to achieve sustainability objectives. The focus is on overall sustainable solutions tailored to the needs of end-users and/or the systems. More specifically, R&I activities will contribute to economic circularity by promoting reuse of materials and waste reduction, adding value to existing knowledge and increasing cost-effectiveness, safety and trustworthiness of innovative environmentally-friendly technologies in and across primary production sectors, food systems, bio-based sectors, bioeconomy, and sectors related to the oceans and biodiversity.

It will also increase attention given to precision and collaborative technologies and contribute to the human-centric twin green and digital transitions. This is a key policy objective that is also supported by the cross-cutting objective pursued by the CAP, the EU digital strategy, the European industrial strategy, the circular economy action plan, the SME strategy and the European data strategy.

Strengthening agricultural knowledge and innovation systems (AKIS)⁴¹⁴

Knowledge and advice to all actors relevant to this cluster are key to improving sustainability. For instance, primary producers have a particular need for impartial and tailored advice on sustainable management choices. Agriculture Knowledge and Innovation Systems (AKIS, which are at the heart of the 2023-2027 CAP's cross-cutting objective, go beyond agriculture, farming and rural activities and cover environment, climate, biodiversity, landscape, bioeconomy, consumers and citizens, i.e. all food and bio-based systems including value chains up to the consumer. R&I actions under this destination will support effective AKIS as a key driver to bridge the gap between science and practice and to enhance co-creation. This will speed up innovation and the take-up of results needed to achieve the European Green Deal objectives and targets.

This includes promoting interactive innovation and co-ownership of results by users as well as strengthening synergies with other EU funds, especially the CAP, boosting the multi-actor approach and setting up structural networking within national/regional/local AKIS. In addition, social innovation also has the potential to achieve the objectives set in this destination, as it strengthens the resilience of communities, increases the relevance, acceptance and uptake of innovation, and helps bring about lasting changes in social practices, therefore acting as a system changer.

Where appropriate, proposals are encouraged to cooperate with the European Commission Knowledge Centre on Earth Observation (KCEO)⁴¹⁵, in order to e.g. disseminate and exploit results.

Expected impact

⁴¹⁴ AKIS refers to the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields.

⁴¹⁵ https://knowledge4policy.ec.europa.eu/earthobservation_en.

Proposals for topics under this destination should set out a credible pathway contributing to innovative governance and sound decision-making on policies for the green transition and more specifically to one or more of the following impacts:

- innovative governance models enabling sustainability and resilience notably to achieve better informed decision-making processes, societal engagement and innovation;
- areas related to the European Green Deal benefit from further deployment and exploitation of environmental observation data, products and “green” solutions;
- a strengthened Global Earth Observation System of Systems (GEOSS)⁴¹⁶;
- sustainability performance and competitiveness in the areas covered by Cluster 6 are improved through further deployment of digital and data technologies as key enablers;
- stakeholders and end users including primary producers and consumers are better informed and engaged thanks to effective platforms such as AKIS;
- strengthened EU and international science-policy interfaces to achieve the Sustainable Development Goals.

When considering their impact, proposals also need to assess their compliance with the “Do No Significant Harm” principle according to which the project’s R&I activities should not support or carry out activities that cause a significant harm to any of the six environmental objectives of the EU Taxonomy Regulation ⁴¹⁷.

Topics under this destination will have impacts in the following areas:

- “Climate change mitigation and adaptation”;
- “Clean and healthy air, water and soil”;
- “Enhancing ecosystems and biodiversity on land and in water”;
- “Sustainable food systems from farm to fork on land and sea”;
- “High quality digital services for all”;
- “A Competitive and secure data-economy”.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. In this cluster, it is envisaged that topics will be coordinated with European Space Agency (ESA)

⁴¹⁶ The European Commission is a member and co-chair of the Group on Earth Observations (GEO), as such the European Commission adopted the [GEO Canberra Declaration](#) and Commission Decision C(2019)7337/F1, and committed to contribute to the GEO objectives, including to the Global Earth Observation System of Systems (GEOSS).

⁴¹⁷ As per Article 17 of Regulation (EU) No 2020/852 on the establishment of a framework to facilitate sustainable investment (EU Taxonomy Regulation).

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actions so that ESA space data and science can be proactively integrated into the relevant research actions of the WP.

The following call(s) in this work programme contribute to this destination:

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL6-2023-GOVERNANCE-01	130.00	20.00	23 Mar 2023
HORIZON-CL6-2023-GOVERNANCE-02	4.00		21 Sep 2023
HORIZON-CL6-2024-GOVERNANCE-01		133.50	28 Feb 2024
Overall indicative budget	134.00	153.50	

Call - Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2023-GOVERNANCE-01

Conditions for the Call

Indicative budget(s)⁴¹⁸

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million) ⁴¹⁹	Indicative number of projects expected to be funded
		2023	2024		
Opening: 22 Dec 2022 Deadline(s): 23 Mar 2023					
HORIZON-CL6-2023-GOVERNANCE-01-1	COFUND	20.00	20.00	Around 40.00	1
HORIZON-CL6-2023-GOVERNANCE-01-10	CSA	2.00		Around 2.00	1
HORIZON-CL6-2023-GOVERNANCE-01-11	RIA	9.00		Around 9.00	1
HORIZON-CL6-2023-GOVERNANCE-01-12	RIA	7.00		Around 7.00	1
HORIZON-CL6-2023-GOVERNANCE-01-13	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023-GOVERNANCE-01-14	CSA	5.00		Around 5.00	1
HORIZON-CL6-2023-	RIA	5.00		Around	1

⁴¹⁸ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.

The Director-General responsible may delay the deadline(s) by up to two months.

All deadlines are at 17.00.00 Brussels local time.

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

⁴¹⁹ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

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GOVERNANCE-01-15				5.00	
HORIZON-CL6-2023- GOVERNANCE-01-16	RIA	10.00		Around 5.00	2
HORIZON-CL6-2023- GOVERNANCE-01-17	RIA	8.00		Around 4.00	2
HORIZON-CL6-2023- GOVERNANCE-01-18	CSA	4.00		Around 2.00	2
HORIZON-CL6-2023- GOVERNANCE-01-19	CSA	6.00		Around 3.00	2
HORIZON-CL6-2023- GOVERNANCE-01-2	RIA	6.00		Around 6.00	1
HORIZON-CL6-2023- GOVERNANCE-01-20	CSA	5.00		Around 5.00	1
HORIZON-CL6-2023- GOVERNANCE-01-21	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023- GOVERNANCE-01-22	CSA	4.00		Around 4.00	1
HORIZON-CL6-2023- GOVERNANCE-01-3	RIA	3.00		Around 3.00	1
HORIZON-CL6-2023- GOVERNANCE-01-4	RIA	6.00		Around 6.00	1
HORIZON-CL6-2023- GOVERNANCE-01-5	RIA	5.00		Around 5.00	1
HORIZON-CL6-2023- GOVERNANCE-01-6	CSA	1.50		Around 1.50	1
HORIZON-CL6-2023- GOVERNANCE-01-7	RIA	4.00		Around 4.00	1
HORIZON-CL6-2023- GOVERNANCE-01-8	CSA	3.50		Around 3.50	1
HORIZON-CL6-2023- GOVERNANCE-01-9	CSA	2.00		Around 2.00	1
Overall indicative budget		130.00	20.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Innovating with governance models and supporting policies

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE-01-1: European partnership of Agriculture of Data

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 40.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 40.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>The funding rate is 30% of the eligible costs.</p> <p>Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. As financial support provided by the participants to third parties is one of the primary activities of this action in order to be able to achieve its objectives, the 60 000 EUR threshold provided for in Article 204 (a) of the Financial Regulation No 2018/1046 does not apply. The maximum amount to be granted to each third party is EUR 10 000 000 for the whole duration of Horizon Europe.</p>
<i>Total indicative budget</i>	<p>The total indicative budget for the duration of the partnership is EUR 100 million.</p>

Expected Outcome: A successful proposal will contribute to the objectives of the Agriculture of Data partnership proposal including the strategic research and innovation agenda. This partnership aims to enhance climate, environmental and socio-economic sustainability and productivity of agriculture and to strengthen policy monitoring and evaluation capacities through exploiting the potential of Earth and environmental observation and other data, in combination with data technologies.

Proposals are expected to contribute to all of the following outcomes (as listed in the partnership document⁴²⁰):

- Increased sharing and harmonisation of data across different actors (e.g. scientists, technicians, policymakers, practitioners, businesses, farmers, end users) and countries based to the extent possible on FAIR⁴²¹ data principles, and exploitation of synergies through better integration of the digital Earth, environmental observation, space observation and agricultural communities within Europe, transforming both the R&I and economic systems to deliver more and better data-based solutions to the end users;
- Increased environmental, climate and socio-economical sustainability performance of the agriculture sector;
- Enhanced contribution from the agriculture sector to the important need for protecting the environment, halting and, if possible, reversing biodiversity loss in Europe and globally, as well as to the reduction of greenhouse gas emissions from agriculture;
- Enabling the sector and strengthen its capacity to adapt to climate change and to meet the objectives set by sustainability-related policies, considering e.g. risk analyses/indicators, such as environmental, technical, economic or social risks;

⁴²⁰ https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_he-partnership-agriculture-data.pdf

⁴²¹ <https://www.go-fair.org/fair-principles/>

- Contribution to creating structures and/or its concept under the umbrella of the partnership Agriculture of Data that includes data infrastructure needed to provide data-based solutions for both policy-making and the agriculture sector (including to strengthening the sector's economic performance);
- Strengthened capacities to evaluate the effectiveness of policies (with reference to agriculture, environmental- and market-related policies and the combined potential effects of them).

Scope: Sustainable agricultural production and policy monitoring needs can be supported through the provision of tailored data and data-based solutions; especially, through Earth/environmental observation and in combination with other data and data technologies. At the same time, the agricultural sector at farm level produces data during digitalised farming practises, as also does the public administration. This data can be capitalised to strengthen capacities of the agricultural sector in the public and the private domains. Integrating different sources of data, for instance Copernicus⁴²² data, precision farming data, Integrated Administration Control System (IACS⁴²³)-data and other reference data, would lead to even more relevant information in this context and provide scope for the development, delivery and uptake of agri-digitalisation products and services, such as decision-making support systems.

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing joint calls for transnational proposals resulting in grants to third parties.

The successful proposal should:

- Exploit the potential of public and private data, including in the combination with data technologies (including AI) for the agricultural sector in the public and private domain;
- Build on results of existing (ongoing or finished) initiatives and projects;
- Foster EU-wide solutions, scaling up⁴²⁴ of use-cases and applications close to deployment stage;
- Develop data-based solutions and digital applications in support of achieving the expected impacts of the partnership;
- Consider the necessary technical systemic elements related to e.g. digital and data infrastructure and interoperability;
- Demonstrate how the expected result contribute to the European Green Deal objectives and the ambition of better policy-making⁴²⁵;

⁴²² <https://www.copernicus.eu/en>

⁴²³ https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/financing-cap/financial-assurance/managing-payments_en

⁴²⁴ Scaling up should be considered as both the scaling up in TRL or scaling up in geographical outreach

- Demonstrate how it will align to the ongoing work of the Horizon Europe partnership on Agriculture of Data and the projects granted under call HORIZON-CL6-2022-GOVERNANCE-01-11: Upscaling (real-time) sensor data for EU-wide monitoring of production and agri-environmental conditions⁴²⁶.

A successful proposal is expected to explore the potential for achieving synergies with relevant topics/ projects, partnerships and/ or missions particularly within Cluster 6 and Cluster 4 of the Horizon Europe programme, as well as with the digital Europe programme, the EU space programme and the common agricultural policy.

The strategic research and innovation agenda for the partnership on agriculture of data will give further guidance on possible specific elements to be addressed within the proposal.

The Commission envisages to include new actions in its future work programmes to provide continued support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2023-GOVERNANCE-01-2: Advancing analytical capacity and tools to support EU agri-food policies post 2027

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome: In line with the European Green Deal, the European Commission aims at more sustainable food systems that reduce their negative impact on climate change and biodiversity loss, while ensuring that farmers and consumers can benefit from it and our long-term food security and public health. Successful proposals will advance analytical capacity and tools to support future evidence-based policies to accelerate the transition to sustainable food systems. While the focus is on agri-food policies, European Green Deal actions relating to climate and environment should also be integrated in the assessment/approaches where relevant.

⁴²⁵ https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how_en

⁴²⁶ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl6-2022-governance-01-11>

Project results are expected to contribute to all of the following expected outcomes:

- Improved analytical capacity and tools (including models) to assess short-term and long-term impacts of future EU agri-food policies on food systems (and on their actors);
- Enhanced evidence-based knowledge supporting analysis and design of agri-food policies.

Scope: Various studies recently published, analysed the possible effects of some elements of the farm to fork and biodiversity strategies on EU agriculture⁴²⁷. The studies provide both the scientific community and policymakers with a valuable insight on the choice of policy tools to minimize trade-offs and maximise synergies between the impacts. However, the models used in the studies all have their limitations. They do not comprehensively address all the components of the European Green Deal in order to adequately support policy analysis. In view of that, the proposals should address these limitations and:

- Build and/or advance analytical capacity to support the quantitative assessment of impacts of future agri-food policies on economic, social (including health), environmental and climate sustainability of food systems;
- Address the modelling gaps that were not taken into account in previous studies¹⁸⁴ to enable analyses of the effects of the agri-food policies on sustainability (including public health) of food systems under diverse scenarios, with particular attention to trade-offs and synergies that they may entail in order to improve policy coherence;
- Further develop, expand and improve the models covered under iMAP, also by exploiting linkages and integrations with other models. New approaches should be developed for further advancing the state of the art by modelling, e.g., input use and costs, uptake of new knowledge, practices and innovations, supply chains, consumer behavioural changes, circular economy, health care system, public health, etc.
- Particular attention should be given to capturing shifts in supply and demand, and feedback loops throughout the food system – upstream and downstream of agriculture. Further advancing the state of the art by modelling, e.g., input use and costs, uptake of new knowledge, practices and innovations, supply chains, consumer behavioural changes, circular economy, etc. Linkages between economic and bio-physical models should be improved.
- Moreover, alternative quantitative approaches to modelling should be developed, especially for improving the capacity to assess:
 - o interrelations (e.g., absence of pure and perfect competition) and impacts on different actors across the food systems, e.g., farmers, SMEs, consumer, food supply chains, etc.;

⁴²⁷ European Green Deal targets for 2030 and agricultural production studies (February 2022).
https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/factsheet-farmtofork-comparison-table_en.pdf

- o nature-based approaches, cost of no action, biomass balance, etc.
- Collaborate and complement the projects funded under Horizon 2020 (e.g., SFS-49-2017: SUPREMA⁴²⁸; RUR-03-2018: CONSOLE, Contract2.0 and EFFECT; RUR 04-2018-2019: Mind Step, BESTMAP, AGRICORE and BATModel) and Horizon Europe (e.g., BrightSpace and LAMASUS).
- Guide long-term model developments, identify new potential interesting models, preserve and build stable bridges between models, integrate models and enable improved multi-disciplinary research related to the European Green Deal or other relevant future policy initiatives.
- Ensure consistency with modelling tools used to monitor and evaluate environmental and climate policies in related fields (e.g. emissions and removals in LULUCF and agriculture sectors for greenhouse gas inventories).

This project requires a multi-disciplinary approach/teams encompassing economics, environment and climate, health and other social policies.

It is key also to establish a regular dialogue with the European Commission regarding objectives, timeline and main deliverables with the goal to provide analytical tools and evidence-based knowledge to support implementation and future developments of agri-food policies, notably the common agricultural policy (CAP) post 2027 and the future EU legal framework for sustainable food systems.

Collaboration with the JRC is strongly encouraged. The possible participation of the JRC in the project will ensure that the approach proposed will advance jointly the state of the art, and be compatible and effectively integrated with the tools used at the European Commission. Project duration should not be shorter than four years.

HORIZON-CL6-2023-GOVERNANCE-01-3: Towards CAP post 2027: evidence on nudging farmers to leverage more sustainable practices and behaviours

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility</i>	The conditions are described in General Annex B. The following

⁴²⁸

<https://www.suprema-project.eu/images/RoadMap-Conclusions-PolicyBrief1.pdf>

<i>conditions</i>	exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding. The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
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Expected Outcome: In line with the European Green Deal, notably the farm to fork and EU biodiversity strategies, the fit for 55 legislative package, the EU action plan: 'towards zero pollution for air, water and soil' and the common agricultural policy (CAP), the successful proposals should support the development of policies, business models and market conditions that enable sustainable, productive and climate-neutral agricultural systems. The farming systems should provide consumers with healthy and sustainable food affordable for all, improving public health, minimising pressure on and enhancing biodiversity and ecosystem services, contributing to climate neutrality, and generating fair economic returns for farmers.

Proposals results are expected to contribute to all of the following expected outcomes:

- Innovative green nudges efficiently contribute to move farmers and foresters towards more sustainable practices that enhance climate action (i.e. reduce greenhouse gas emissions and increase carbon removals), biodiversity protection and restoration, and the reduction of emissions or concentrations of air pollutants;
- Models of social innovation and innovative co-operation along the value chains which nudge farmers and foresters towards more sustainable behaviours;
- New effective nudging solutions are provided to policymakers to better address sustainability goals;
- Green nudges are used to complement environmental, food and bioeconomy policies towards more sustainable and circular production systems;
- New policies are designed taking into account farmers' environmental attitudes, risk aversion, inequality aversion, cognitive strategies and the importance of non-monetary benefits.

Scope: According to the prediction of the Food and Agriculture Organization, food supply must increase by almost 70% by 2050, with tremendous consequences in terms of land depletion, natural capital and resource use, and greenhouse gas emissions. The current agri-food system is inadequate to the need to cope with this increased demand while also preserving the environment.⁴²⁹ Although the EU has made strides in improving the sustainability of agriculture, substantial efforts are still needed to achieve the ambitious targets of the European Green Deal, in particular the bioeconomy strategy, EU farm to fork

⁴²⁹ [Can nudging improve the environmental impact of food supply chain? A systematic review - ScienceDirect.](#)

and biodiversity strategies 2030, the communication on sustainable carbon cycles, farm to fork strategy, circular economy action plan (CEAP) and the objectives of the 2023-2027 CAP. The common agricultural policy is a key tool to achieve a sustainable transformation, and it puts farmers at the core of its actions. We currently know very little about the role of behavioural factors in determining farmers choices and whether non-pecuniary mechanism, such as policy nudge⁴³⁰, can be used effectively in policy design. Evidence about the adoption of nudging tools in promoting environmentally sustainable practices along the food supply chain, including the role of circular bio-based options⁴³¹, are still relatively sparse. In particular, nudges that have been proved to work efficiently on the consumer side (e.g., default nudges, social norm nudges, choice architecture) do not translate well to farmers, and farmers may respond to nudges in a heterogeneous manner, based on their specificities⁴³².

An in-depth understanding of farmers' nudges is key to spurring large-scale and lasting shifts to sustainable farming systems.

Proposals should take a comprehensive behavioural approach and investigate proximal and distal factors to better understand farmers' behaviour in decision-making, in order to inform the design and implementation of EU policies (in particular the CAP) and the European Green Deal initiatives with particular focus on farm to fork, biodiversity strategies and climate action.

Proposals should:

- Investigate whether green nudges are able to generate robust and durable behavioural change in farmers and foresters and look into existing and efficient nudging practices in agriculture and forestry sectors to create best practices and develop recommendations for EU policymakers on nudging in public policies of concern for farmers and foresters.
- Investigate, identify and test innovative nudging practices to help farmers and foresters move into sustainable farming systems, also considering behavioural factors that could influence farmers/foresters deciding or not to engage in these practices.
- Investigate these behavioural factors and identify innovative tools to enlarge knowledge in this field and to improve farmers and foresters' self-regulatory capacity. Test appropriate policy mechanisms for incorporating the perception of farmers and foresters in decision-making and assess the potential for upscaling innovative nudging practices.
- Create policy recommendations to the decision-makers, including to the AKIS Coordination Bodies in member States, to adapt and tailor CAP AKIS interventions accordingly.

⁴³⁰ Nudges is defined as an intervention which leads to a predictable change in behaviour by reinforcing the intentions to act in a sustainable way or by indirectly suggesting adoption of new practices that are easy to implement and do not fundamentally change the incentives of individuals or groups of individuals.

⁴³¹ Complementary to the topic HORIZON-CL6-2023-GOVERNANCE-XX: Revitalisation of European local (rural / peri-urban) communities with innovative bio-based business models and social innovation
⁴³² <https://publications.jrc.ec.europa.eu/repository/handle/JRC122308>.

Proposals should explore social innovation and innovative forms of cooperation, including multi-stakeholder/multi-actor partnerships along the value chains, as well as how interactions within value chains/sectors contribute to or hinder the adoption of relevant sustainability-oriented innovations. The proposals are expected to use the multi actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.

The JRC participation could involve contributing to the investigation, identification and design of nudging practices and eventually participate in the testing phase in one country.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this or other topics (i.e. but not limited to projects funded under topic HORIZON-CL6-2021-FARM2FORK-01-08)

Beyond open access to scientific publications and research data, open access to software, models, workflows, etc. is required to ensure accelerated uptake of innovation, increase research transparency, support immediate and extensive re-use of research materials, and support collaborative and interdisciplinary work, among others.

HORIZON-CL6-2023-GOVERNANCE-01-4: Developing an interdisciplinary and inclusive pan-European academic network for food system science

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: the proposals must establish a pan-European network and carry out inter- and transdisciplinary research, as well as policy research, support education and outreach.</p>

Expected Outcome: In line with the objectives of the European Green Deal, the farm to fork strategy for a fair, healthy and environment-friendly food system, the Food 2030 priorities and the EU’s climate ambition for 2030 and 2050, the successful proposal will contribute to the transformation and sustainability of EU food systems by supporting the establishment of

innovative governance models notably to achieve better-informed decision-making processes and facilitate inter- and transdisciplinary research methods.

Successful proposals will develop an interdisciplinary and inclusive pan-European academic network for food system science that integrates the social sciences and humanities (SSH), design, engineering and natural and applied sciences. Central to the work of the academic network is the concept of Responsible Research and Innovation (RRI). In particular, successful proposals will set out how the network and its members can work to improve and/or develop: new methods and tools, data access and knowledge sharing, inter- and transdisciplinary research and the assessment of impacts in complex and interconnected food systems. The network will act as a European building block in fostering improved food system governance at all scales and will connect with related key international fora. By deepening engagement amongst researchers, scientific disciplines and science performers, this initiative will build capacity to strengthen the role of science and knowledge for sustainable food systems transition in Europe and beyond.

Project results are expected to contribute to all of the following expected outcomes:

- Establish a broad pan-European interdisciplinary academic network.
- Foster inter-, transdisciplinary, participatory, policy and regulatory research to develop new insights, findings, models, methods and tools to assess and manage the full systemic complexity of food systems.
- A strengthened European Research Area for sustainable food systems transformation for co-benefits, which federates a wide diversity of scientific actors across Europe, promotes gender equality in research, attracts young talents and fosters inclusiveness and cooperation across scientific disciplines, and promotes education and outreach.
- Contribution to the farm to fork objectives and Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: Food systems face the triple challenge of providing food security and nutrition for a growing global population, and livelihoods to farmers (OECD, 2021).⁴³³ To meet these challenges, a food system transformation is needed to make the EU food system future-proof, in line with the farm to fork strategy and the European Commission's food 2030 initiative.

The project will build an interdisciplinary and inclusive pan-European academic network for food system science, that will integrate the social sciences and humanities, design, engineering and natural and applied sciences. The aim of the network is to federate research performers including universities, national science academies and research centres, academics and researchers across Europe to work together on sustainable food systems transition by

⁴³³ OECD (2021), *Making Better Policies for Food Systems*, OECD Publishing, Paris, <https://doi.org/10.1787/ddfba4de-en>.

carrying out inter- and transdisciplinary research, developing and applying new methods, models and tools, improving data and knowledge sharing, fostering debate and providing advice to policy makers for improved decision-making at all levels – from global to local, as needed.

Proposed activities should cover all of the following aspects:

- Establish a broad pan-European interdisciplinary network of researchers, scientists, and research performers including national science academies, universities and research centres representing diverse and interconnected food systems-related disciplines.
- The network will conduct different types of research: inter-, transdisciplinary and participatory research, as well as policy/regulatory research.
- Interdisciplinary research activities will develop new systems science insights, models, methods and tools to assess and manage the full systemic complexity of food systems, their multiple drivers and dynamics, with the aim of providing research outcomes that deliver co-benefits and minimise adverse effects. The research will also increase understanding of how food systems interact with other bioeconomy demands on biological resources (e.g., energy system, bio-based industry, climate mitigation and adaptation, supply of ecosystem services, etc.).
- Transdisciplinary and participatory research activities will foster collaboration with different food systems stakeholders (e.g., public authorities, local and regional communities, civil society organisations, the private sector, consumers, etc.) to identify knowledge gaps, high priority research needs, and collaborative responses to them. This may include the organization of iterative stakeholder workshops, interviews, questionnaires and the collaboration with existing or future food policy/living labs.
- Policy and regulatory research activities will be designed to provide evidence to support systemic policy and decision making, as needed. In this respect, research is welcome on how to transition to a true cost of food that adequately embeds social and environmental externalities at all levels (global to local).
- Building on the RTD/2020/SC/022 study “Promote education, training and skills across the bioeconomy”, the network will develop open access educational material/curricula to be used by Higher Education Institutes to help strengthen their existing food systems-related teaching and research with an inter- and transdisciplinary systems dimension.
- Support the training, mobility, mutual learning and knowledge sharing amongst researchers (including masters to post-doc levels) and foster open science approaches that also accelerate gender equality, attract young talents, foster inclusiveness and reuse of research knowledge (including the sharing of FAIR and open digital research or educational output). This will also include the organization of a high-level annual summer camp/school providing inter- and transdisciplinary food systems and bioeconomy science training open to youth from all over Europe.

- Organise an international bi-annual conference dedicated to advancing integrated food systems science. In this context special attention will be placed on awarding excellence amongst young researchers, including young women researchers.
- Establish a high-level liaison with EU and relevant international initiatives acting at the science-policy interface for improved food systems governance.
- Proposals are encouraged to cooperate with actors such as the European Commission’s Joint Research Centre (JRC). The JRC may provide expertise on how to strengthen the relationship between scientists and European policy makers and to promote research and collaboration on food systems science.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with the projects funded under the work programme from WP2021-2022, namely HORIZON-CL6-2021-GOVERNANCE-01-02 (FOSTER, Fostering food system transformation by integrating heterogeneous perspectives in knowledge and innovation within the ERA) and with the living labs and lighthouses foreseen under the Horizon Europe Mission ‘A Soil Deal for Europe’. Projects should also build on the findings of the European Commission’s High Level Expert Group (HLEG) that addressed needs and options to strengthen the international science policy interface for improved global food system governance.

Collaboration and complementary with the European Partnership on “Sustainable Food Systems for People, Plant and Climate” is encouraged. In order to achieve the expected outcomes, international cooperation is encouraged.

Efforts shall be made to ensure that the data and the educational output produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

HORIZON-CL6-2023-GOVERNANCE-01-5: Revitalisation of European local (rural / peri-urban) communities with innovative bio-based business models and social innovation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: Successful proposals will contribute to the expected impacts of Destination ‘Innovative governance, environmental observations and digital solutions in support of the Green Deal, and the European policies it supports, by supporting the

establishment of the innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation. Furthermore, it will contribute to strengthened EU and international science-policy interfaces to achieve the Sustainable Development Goals.

Proposal results are expected to contribute to all following expected outcomes:

- Higher impact of bio-based innovation to accelerate the transition from a linear fossil-based economy, which leads to overuse and depletion of natural resources, into a resource-efficient and circular bio-based systems operating within safe planetary boundaries.
- Improved and informed public awareness, governance and especially social innovation contributing to reduced resource consumption and increased innovation capacity of all actors, in respect to circular bio-based sectors, reduced risk of leaving anyone behind, particularly in the areas and communities in need of revitalization (focus on rural and peri-urban areas).
- Higher level of innovation at local scale and inclusive engagement of all actors (especially focusing on the ‘social enterprise’ model relevant for vulnerable populations).

Scope:

- Proposals will benefit from social creativity and economic opportunities at local/regional scale unleashed for bio-based systems, taking care of their high environmental performances, in terms of local bio-based feedstock, resources, processes, skills, materials and products. Impacts and trade-offs, such as lower carbon footprint and environmental impacts of the whole value chains shall be part of the assessment of the bio-based systems.
- Communication and dissemination activities need to take into account the inclusive nature of engagement of local actors (e.g., use of languages, mutual learning process, trust building measures), to achieve exchange of best practice at European level, and connection to appropriate local governance structure.
- Integration of regional, local, or macro-regional policy makers is considered essential, as is the involvement of civil society (NGOs, consumer organisations, etc). This should include the assessment of robustness of existing governance schemes, to allow replication across Europe (taking into account the issues such as the income generation for all stakeholders, labour conditions, environmental indicators, social engagement, innovation parameters etc).
- The development of novel bio-based models shall involve economic actors, primarily SMEs, but also rural entrepreneurial structures (e.g., cooperatives, professional associations). Digital solutions to connect and inform all stakeholders, including consumers, shall be given due consideration.

- Projects should build on past or parallel activities, e.g., Horizon 2020 projects Power4Bio, BE-Rural or the projects funded under the call HORIZON-CL6-2021-GOVERNANCE-01-09: Revitalisation of European local communities with innovative bio-based business models and social innovation, as well as the past/on-going projects under the Bio-based Industries Joint Undertaking (BBI JU), seeking synergies and links with upcoming activities of the Circular Bio-based Europe Partnership⁴³⁴, as well as Horizon Europe calls⁴³⁵.
- In order to avoid the risk of duplication of efforts and to limit the focus to rural and peri-urban actions, the present topic excludes blue (marine and maritime) bio-based activities from its scope.
- International cooperation should be considered, aiming at exchange of best practice.
- Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. Proposal should explore intersectionality approaches and consider aspects like gender, ethnicity, migrant or refugee status, social class, sexual orientation and disability to ensure inclusion of marginalised groups in citizen engagement and the development of tools and guidelines.
- This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

HORIZON-CL6-2023-GOVERNANCE-01-6: Co-creation and trust-building measures for biotechnology and bio-based innovation systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 1.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 1.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant</i>	The rules are described in General Annex G. The following exceptions apply:

⁴³⁴ www.bbi.europa.eu/about/circular-bio-based-europe-joint-undertaking-cbe-ju.

⁴³⁵ E.g., under the Destination – Resilient, inclusive, healthy and green rural, coastal and urban communities e.g., see topic HORIZON-CL6-2024-COMMUNITIES-02-1-two-stage: Innovating for climate-neutral rural communities by 2050.

<i>Agreements</i>	Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴³⁶ .
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Expected Outcome: Successful proposal will contribute to the expected impacts of Destination ‘Innovative governance, environmental observations and digital solutions in support of the Green Deal’, and the European policies it supports, by supporting the establishment of the innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation.

Projects results are expected to contribute to all following expected outcomes:

- Developing a co-creation programme and guidelines on improved knowledge exchange and awareness raising for biotechnology with focus on bio-based innovation.
- Improvement of innovation uptake for modern and emerging key enabling technologies, in particular (industrial) biotechnology and related bio-based value chains across the EU, supporting the EU Bioeconomy Strategy Action Plan⁴³⁷ and the Industrial Strategy.
- Creation of the forum to foster an inclusive, science-oriented mutual learning platform, engaging all actors, especially those in the advisory capacity, policy makers at all levels, the civil society and the biotechnology sector.
- Reinforcing the evidence-based understanding of potential positive (benefits) and negative impacts of biotechnology.
- Development of the transparent and inclusive trust building measures for the implementation of industrial biotechnology, and bio-based innovation according to the UN Sustainable Development Goals.

Scope:

- Transparent and informed governance and innovation, such as industrial- and other types of biotechnology, based on evidence and underpinned by public trust, could contribute to improved resource efficiency, limit the wastage, enable an increased innovation capacity of all actors, and contribute to industrial competitiveness with new products and services.

⁴³⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴³⁷ Action 3.1.3. Study and analysis of enablers and bottlenecks and provide voluntary guidance to the deployment of bio-based innovations.

- The key priorities in this regard are the consumer and environmental safety, both in terms of respecting the planetary boundaries (e.g., limiting the potential higher resource consumption), and a capacity to transparently address the risks through the risk analysis framework, while taking into account diverse social attitudes and understanding especially regarding environmental (e.g., biodiversity) considerations.
- Proposals will benefit from social creativity and engagement and will seek to support the improved understanding at all scales to unleash the innovation for bio-based systems, taking care to address their potential advantages in terms of feedstock, resources, processes, materials and products. Impacts and trade-offs, such as resource efficiency, carbon and biodiversity footprint and potential negative health and environmental effects of the whole value chains shall be considered⁴³⁸.
- The proposals will seek complementarities with related actions on governance of bio-based innovation and ensure inclusiveness and engagement of all actors⁴³⁹.
- International cooperation is encouraged, aiming at exchange of best practice at global level.
- This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

HORIZON-CL6-2023-GOVERNANCE-01-7: Integrated assessment of land use and biomass demands to contribute to a sustainable healthy and fair bioeconomy

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

⁴³⁸ See parallel topic HORIZON-CL6-2023-ZEROPOLLUTION-01-5: Industrial biotechnology approaches for improved sustainability and output of industrial processes.

⁴³⁹ E.g., see parallel topic HORIZON-CL6-2024-CircBio-01-9: Bioeconomy project development assistance, other topics in this Destination and activities of the Circular Bio-based Europe JU.

	The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
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Expected Outcome: In line with the European Green Deal priorities, the EU's climate ambition for 2030 and 2050 and the bioeconomy strategy vision of an economic system that acts within environmental and social boundaries, the successful proposal will aim to develop or improve land use models and tools, enabling sustainability assessments to support better-informed policy- and decision-making processes, particularly on a national and regional level. European Green Deal related policy domains will benefit from further deployment and exploitation of this Environmental Observation data.

Project results are expected to contribute to all of the following expected outcomes:

- Better understanding, methods and tools for determining the potential and limits of land and biomass to contribute to the climate, biodiversity, environmental, as well as social and economic objectives of the European Green Deal.
- Enhanced knowledge on the policy pathways for maximising the climate benefit of bioeconomy solutions within ecological boundaries and improved decision-making for ensuring policy coherence on the national and regional level.

Scope:

- Improve understanding of direct and indirect implications of current and future regional, national or EU policies and targets on land and biomass use, including an assessment of existing and emerging trade-offs, using and improving existing databases with high resolution data.
- Develop methodologies as well as tools for national and regional policy- and decision-makers to carry out integrated bioeconomy assessments of land and biomass use. The assessments will integrate existing and future EU, national and regional climate, environmental and food policies with projections on industrial biomass demand, and assess their implications on land and biomass use, taking into account trade-offs and synergies.
- Using the methodologies, quantify and project the land and biomass use and its climate mitigation potential, including the substitution effect of bio-based products and land impacts of diets, in at least four case study regions covering different socio-economic situations and climate/ecological zones in the EU and Associated Countries. The data should also cover, but not be excluded to, land use intensity and management types and their respective areas as well as biomass stocks and flows.
- Take into account biophysical and as far as possible, legal and socioeconomic constraints determining possible land use and biomass potentials.

- Seek to understand and identify factors determining land management practices and enabling nature-based solutions that maximise the co-production of ecosystem services, biodiversity restoration and preservation, enhanced climate mitigation and net primary production.
- Seek to understand and identify optimum/sustainable land-dependent and land-independent food supply for healthy, safe and sustainable diets.

The proposals must use the multi-actor approach by involving a wide diversity of bioeconomy actors and conducting trans-disciplinary research.

Where relevant, activities should build and expand on the results of past and ongoing research projects. The project requires an active collaboration with the JRC on the development of the necessary methods and approaches for the activities described in the scope of the topic.

HORIZON-CL6-2023-GOVERNANCE-01-8: Mobilising BIOEAST networks for the development of national bioeconomy action programmes in support of the European Green Deal

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁴⁰ .

⁴⁴⁰ This [decision](#) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link:

Expected Outcome: In line with the European Green Deal priorities, the EU's climate ambition for 2030 and 2050 and the bioeconomy strategy vision of an economic system that acts within environmental and social boundaries, the successful proposal will support R&I to strengthen the national bioeconomy networks in BIOEAST⁴⁴¹ countries for the development of national bioeconomy action programmes and engage relevant stakeholders in the development of the action plans. The successful proposal will contribute to the expected impacts of Destination 'Innovative governance, environmental observations and digital solutions in support of the Green Deal', and the European policies it supports, by supporting the establishment of the innovative governance models notably to achieve better informed decision-making processes, social engagement and innovation.

Project results are expected to contribute to all of the following expected outcomes:

- Strengthened human capacity and competitiveness of the BIOEAST public administrative bodies (ministries, research funding organisations, research institutions etc.) for attracting professionals to ensure an adequate number of experts working on bioeconomy issues/coordinating bioeconomy policy development in each Member State.
- Connecting experts and policy makers in national bioeconomy networks for better engagement of stakeholders (ministries, regional authorities, research funding organisations, research organisations, civil society, NGOs and others) and BIOEAST thematic working groups, raising awareness and facilitating communication at the regional, national, macro-regional and EU level.
- Mobilisation and increased linkages of national and regional capacities to leverage investments in education, research, innovation, and the development of bioeconomy programmes.
- Facilitating the development of inclusive national bioeconomy action programmes, such as dedicated bioeconomy programmes in education, national bioeconomy research and innovation framework programmes, national bioeconomy development operational programmes.
- Increased participation and innovation capacity of the BIOEAST Member States and stakeholders in the EU framework programmes and structural funds to leverage their full R&I potential in support of the European Green Deal.
- Improved coherence of policies to build a sustainable bioeconomy within ecological boundaries, contributing in particular to climate and biodiversity policies and targets.

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁴¹ www.bioeast.eu The Central-Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy – BIOEAST – offers a common political commitment and shared strategic research and innovation framework for working towards sustainable bioeconomies in the Central and Eastern European (CEE) countries (Czech Republic, Hungary, Poland, Slovakia, Bulgaria, Croatia, Latvia, Lithuania, Estonia, Romania, Slovenia).

Scope:

- Engage with policy makers and address specific barriers to improve the continuity and coordination of bioeconomy policy development in BIOEAST countries. Bring together national stakeholders in deploying and fostering the bioeconomy-related research and development sector by engaging local actors in macro-regional and European thematic networks and towards building the common European Research Area.
- Better integration of stakeholders into national bioeconomy hubs with the aim of providing a framework and assuring compliance with the EU policy objectives. The proposal should strengthen the role of young generations and start-ups in bioeconomy.
- Provide advisory support for the development of inclusive national bioeconomy action programmes in support of the European Green Deal, ensuring a transparent and inclusive stakeholder engagement at all levels.
- Identify the possibilities to increase national investment in research and development sector and in education related to bioeconomy, e.g. by targeting political commitment, attracting private investors and entrepreneurs and fostering cooperation within countries and across the macro-region.
- This action is expected to contribute to the implementation of the BIOEAST Initiative vision paper with its related action plan. Proposals will cooperate with and support the BIOEAST Initiative.
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with the BIOEASTsUP project developed under Horizon 2020, and ensure synergy with relevant activities carried out under other initiatives in Horizon Europe⁴⁴², seek complementarities with related actions and past projects on bioeconomy governance and ensure inclusiveness and engagement of all actors.⁴⁴³ It is also relevant to cooperate and establish links with the Circular Bio-based Europe (CBE) JU.
- The proposal should include all 11 BIOEAST Member States' and, if possible, the main⁴⁴⁴ bioeconomy coordinating bodies. BIOEAST countries not participating as beneficiaries of the action should benefit from the activities carried out by the project.
- Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

⁴⁴² HORIZON-CL6-2021-GOVERNANCE-01-10: Raising awareness of circular and sustainable bioeconomy in support of Member States to develop bioeconomy strategies and/or action plans.

⁴⁴³ Taking into account the results and activities of relevant Horizon 2020 projects, in particular Bioeconomy Policy Support Facility, BIOEASTSUP, POWER4BIO and BE-RURAL, and/or projects funded under call HORIZON-CL6-2021-GOVERNANCE-01-10: Raising awareness of circular and sustainable bioeconomy in support of Member States to develop bioeconomy strategies and/or action plans, or call HORIZON-CL6-2021-GOVERNANCE-01-08: Improving understanding of and engagement in bio-based systems with training and skills development, as well as the activities of the Circular Bio-based Europe (CBE) JU.

⁴⁴⁴ <https://cordis.europa.eu/project/id/862699>.

- The proposals must use the multi-actor approach by involving a wide diversity of bioeconomy actors and conducting trans-disciplinary research.
- This topic requires the effective contribution of SSH disciplines.

Deploying and adding value to environmental observations

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE-01-9: Coordination and supporting action to increase synergies in the dissemination and exploitation of climate observations by World Meteorological Organization and its affiliated bodies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>The following additional eligibility criteria apply: International organisations with headquarters in a Member State or an Associated Country are exceptionally eligible for funding.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).⁴⁴⁵.</p>

⁴⁴⁵ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Expected Outcome: A successful proposal will be contributing to the further deployment, uptake and exploitation of Environmental Observation data and products in the context of the European Green Deal.

Proposals are expected to contribute to all of the following outcomes:

- Strengthened collaboration and complementarity between the World Meteorological Organization (WMO), the Group on Earth Observations (GEO), the Intergovernmental Panel on Climate Change (IPCC) and the Global Climate Observing System (GCOS) on climate observations.
- Analysis, streamlining and creation of synergies between Work Programmes of above-mentioned bodies and with the objectives of the European Green Deal.
- Promotion of the collection, improvement, dissemination, and exploitation of observations on climate, climate change and its impacts from operational and research observational networks.

Scope: WMO hosts the GEO, IPCC, and GCOS secretariat which are organisations and Joint Programmes whose activities are crucial for the delivery of climate actions under the European Green Deal – in particular the Horizon Europe Mission on Climate Adaptation and Copernicus⁴⁴⁶ – and in this context it is becoming utmost important that the EU can rely on and benefit from well-articulated actions between those organisations.

This coordination and supporting action (CSA) is intended to support WMO, its affiliated bodies GCOS and IPCC, together with GEO in their common endeavours to establish a global system for standardised, open and interoperable climate observations and to exploit them so that they become available as services to the societies and citizens of the world to support their actions to adapt to climate change. The activities of WMO, and its affiliated bodies such as IPCC or GCOS in collaboration with GEO should also contribute to delivering the required information needed in the relevant services of the European Commission to implement its climate related policies.

The CSA should contribute to promoting the development, implementation, and improvement of climate services as per Article 7 of the Paris Agreement, including initiatives such as the Global Framework for Climate Services (GFCS), the Copernicus Climate Change Service (C3S), the Emergency Management Service (CEMS) and the Marine Service (CMEMS), as well as the Global Earth Observation System of Systems and through the prominent contributions to GCOS and the Architecture for Climate Monitoring from Space, by the Copernicus Programme, and the Climate Change engagement priority of GEO. In particular, the CSA should demonstrate the respective strengths and complementarity of the individual organisations and programmes on specific aspects of global climate observations and support the exploitation of synergies.

⁴⁴⁶ <https://www.copernicus.eu/en>.

The successful consortium should collaborate on scientific inputs to high-level climate-related policy processes, including on high-impact events and their associated loss and damage and measures to avert them, the state of the climate and atmosphere, the emerging Ocean and Climate Change Dialogue in UNFCCC and science-based adaptation and mitigation strategies.

The CSA should in a first phase:

- Do the necessary mapping of the respective work programmes and initiatives of the GFCS, C3S, CEMS, CMEMS, GCOS and GEO;
- Identify cross cutting priorities, areas for further collaboration and potential duplications;
- Organise at least one synthesis workshop, associating all the partners and external experts.

The CSA should in a second phase:

- Develop a concrete action plan in collaboration with the respective secretariats of the entities mentioned above;
- Organise a high-level leadership workshop where decisions and firm commitments are to be taken. This second & final workshop should be organised back-to-back with the GEO Plenary meeting.

HORIZON-CL6-2023-GOVERNANCE-01-10: Support to EuroGEO initiative coordination/establishing a EuroGEO secretariat

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 2.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the

	Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁴⁷ .
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Expected Outcome: The successful proposal will be strengthening GEO-related coordination mechanisms at European and national levels. The focus will be on supporting increased innovation, space application development and the reinforcement of a space data ecosystem concept within Europe, whilst pursuing international cooperation to help stimulate the market and promote European technology and services. The successful proposal will be contributing to the European Green Deal objectives by further deploying and exploiting the use of environmental observations⁴⁴⁸ and to a strengthened Global Earth Observation System of Systems (GEOSS)⁴⁴⁹.

Proposals are expected to contribute to all of the following outcomes:

- Support to the EuroGEO⁴⁵⁰ community, including supporting and cooperating with the EuroGEO Action Groups, on innovation and services and where possible link with existing and future the GEO/EuroGEO infrastructure components;
- Establishment of organisational support, e.g., coordination of EuroGEO communication activities and events. This includes the increase of synergies among EU funded projects in the context of environmental observations and other topics related to EuroGEO, providing a solid base for evidence-informed allocation of EU research funding through sound monitoring of ongoing research funding activities in Europe and beyond;
- A more developed and better monitored execution of the EuroGEO Implementation Plan in the GEO Work Programme and visibility and exposure to European lead Flagships and Initiatives in the global GEO WP - linking their thematic products and services to relevant European Policy priorities. This includes support to preparing the contribution of EuroGEO to the next GEO Strategic Plan covering the period post-2025;
- Assistance to the development of a sustainability concept for the EuroGEO initiative;
- Further developed research policies, guidelines and where possible standards in close relation with the EC Knowledge Centre on Earth Observation⁴⁵¹;

⁴⁴⁷ This [decision](#) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁴⁸ The capacity to observe the environment, including space-based, in-situ-based (air, sea, land) observation, and citizen observations.

⁴⁴⁹ <https://www.earthobservations.org/geoss.php>.

⁴⁵⁰ https://ec.europa.eu/info/research-and-innovation/knowledge-publications-tools-and-data/knowledge-centres-and-data-portals/eurogeo_en.

⁴⁵¹ https://knowledge4policy.ec.europa.eu/earthobservation_en.

Scope: This action aims to prepare the transition of the existing EuroGEO initiative into a sustainable endeavour, by setting up a secretariat.

The successful proposal should propose actions for the secretariat to:

- Further strengthen and promote the three EuroGEO priorities: combining, cooperating and coordinating;
- Serve as the basis for evidence-informed allocation of research funding by monitoring ongoing research funding activities in Europe and beyond;
- Provide professional support in organising EuroGEO events and meetings of EuroGEO bodies (Coordination Group and Action Groups);
- Guide the dialogue with relevant stakeholders and initiatives and (further) build connections, including raising awareness of and interest in the EuroGEO initiative.

The successful proposal should carry out an in-depth investigation resulting into a sustainability plan offering options for the long-term operationalisation and sustainability of the EuroGEO initiative, with the GEO Member States and GEO Participating Organisations of Europe.

The proposed sustainability plan should include a suggested pathway towards implementation, such as the implementation of a European Digital Infrastructure Consortium (EDIC)⁴⁵².

The organisational and logistical support of a secretariat should maximise the unique and long-term impact of EuroGEO by strengthening Europe's leading role in the successful deployment of Earth Observation applications in the global context.

The maximum duration of the funded project is 24 months.

HORIZON-CL6-2023-GOVERNANCE-01-11: Reducing observation gaps in the land-sea interface area

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 9.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 9.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility</i>	The conditions are described in General Annex B. The following

⁴⁵² <https://digital-strategy.ec.europa.eu/en/policies/europes-digital-decade>.

<i>conditions</i>	exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
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Expected Outcome: The successful proposal will be contributing to the European Green Deal objectives including the need to address climate change mitigation and adaptation, pollution and biodiversity loss, through up-taking, integrating, further deploying and exploiting environmental observations.

The successful proposal will be contributing to the European strategy for data, the European digital strategy and support Destination Earth with the development of Digital Twins. It will also be contributing to a strengthened Global Earth Observation System of Systems (GEOSS)⁴⁵³ and improvement of data and modelling services provided by European programmes such as Copernicus⁴⁵⁴ - marine, climate, land, and emergency services and the European Marine Observation and Data network (EMODnet)⁴⁵⁵ - and ensure enhanced coordination with ESA relevant activities as part of the EC-ESA Earth System Science Initiative⁴⁵⁶ and in particular with the activities of the ESA Ocean Science Cluster (oceansciencecluster.esa.int).

The successful proposal is expected to contribute to all of the following outcomes:

- Increased availability of integrated in-situ observations at the land-sea interface, with particular emphasis on river mouths, estuaries and deltas in Europe;
- Improved hydrological, biogeochemical, ecological and coastal modelling based on the integration and combination of these new sources of in-situ observations remote sensing data and their combination at the land-sea interface;
- Enhanced networking between the relevant observation communities (in-situ, airborne, satellite, citizen science, etc.) and training of the citizen science community in the approach to the observation of the land-sea interface making use of newly developed low-cost instrumentation;
- Strengthened coordination between Earth observation communities in the land and marine domains, including hydrology, and between the in-situ data collection and satellite ocean communities (e.g., ESA Ocean Science cluster activities), and better integration of observation and modelling science communities working on applications close to shore, to ensure consistency and cross-validation of different types of observations and foster complementarity and enhanced integration into advanced products and multisource information.

⁴⁵³ <https://www.earthobservations.org/geoss.php>.

⁴⁵⁴ <https://www.copernicus.eu/en>.

⁴⁵⁵ <https://emodnet.ec.europa.eu/en>.

⁴⁵⁶ <https://eo4society.esa.int/communities/scientists/ec-esa-joint-initiative-on-earth-system-science/>.

Scope: Fit for purpose in-situ Earth observations are essential for understanding environmental systems and assessing feedback loops/impacts in important interfaces, as is the land-sea interface at the coastal zones. Especially through the contribution of satellite data, there are still important gaps to be addressed to integrate in-situ Earth observations from the terrestrial and marine domains. There is a need for increased capacity to assess trans-domain impacts, develop and validate detailed models and forecasting applications in the land-sea interface. In the framework of the Digital Twin Ocean (DTO) and Destination Earth (DestinE)⁴⁵⁷, the development of integrated observation capacities between land and sea, in the coastal zones and beyond, is necessary to address priorities. These can include the decrease of pollution, protection and conservation of biodiversity and prediction/adaptation to climate change effects related to e.g., erosion, to the loss of land and ecosystems, land and coastal marine heatwaves, acidification, storm surges, floods and salinization. Specific attention should be given to the sea effect on coastal lands (loss of land, habitat, soil salinisation, etc.), the lateral flux of carbon from terrestrial to coastal ecosystems and marine carbon stocks at the coast, observations gaps and integration (suitability of land observations to measure impact at sea and vice versa).

Proposals should address the following:

- Assessment of current in-situ observing capabilities and protocols of the terrestrial and marine domains, including hydrology, with emphasis on the coastal zones and focus on terrestrial/hydrological input to the sea (delta's, river input, agricultural and other run-off, etc.), including issues of spatial and temporal resolution, identification of important gaps and proposals for viable, long-term approaches to address them;
- Development of methods, tools, technologies and processes to fill the identified gaps following the assessment and to increase integrated observing capacity in the coastal zones and in the land-sea interface (including hydrological inputs). These developments should also contribute to upgrading, enhancing and interconnecting the existing observing networks, developing new capacity when necessary;
- Development of interoperability standards between terrestrial and marine data and coordination of existing observation services and networks (EMODnet, Copernicus, GEOSS, WISE, LUCAS, INSPIRE etc.) to promote freely available and uninhibited flows of FAIR⁴⁵⁸ data and to support the creation of data products in the land-sea interface; combination of in-situ observation from land and sea with satellite observation to fill otherwise unaddressed gaps;
- Advance forecasting and modelling capacity in the coastal zones, including for predicting hazardous events, addressing habitat and biodiversity loss, assessing lateral carbon fluxes across the land ocean continuum, addressing shoreline issues such as erosion, detecting/quantifying/managing the impacts of human activity and extreme events due to climate change, and the better integration of river runoffs into marine-

⁴⁵⁷ <https://digital-strategy.ec.europa.eu/en/policies/destination-earth>.

⁴⁵⁸ <https://www.go-fair.org/fair-principles/>.

related predictions (including the inflow of plastic and nutrient loads through rivers and estuaries);

- Developing close coordination and collaboration across scientific communities (e.g., in-situ data, satellite base observations) ensuring data consistency, cross-fertilisation and enhanced data integration.

This topic is part of a coordination initiative between ESA and the EC on Earth System Science. The EC-ESA Earth System Science Initiative enables EC and ESA to support complementary collaborative projects funded on the EC side through Horizon Europe and on the ESA side through the FutureEO programme ⁴⁵⁹.

The applicants under this topic shall enter into contact with the ESA Ocean Science Cluster⁴⁶⁰ of the FutureEO programme, and include in their proposals activities to ensure coordination with ESA relevant actions.

Collaboration with the relevant existing European Research Infrastructures (such as JERICO or Danubius-RI) is highly recommended.

A strong cooperation, through e.g. networking and exchanges of information with relevant projects ⁴⁶¹ and HORIZON-MISSION-2021: “EU Public Infrastructure for the European Digital Twin Ocean and HORIZON-MISSION-2021-05-01: “Underlying models for the European Digital Twin Ocean” is expected.

HORIZON-CL6-2023-GOVERNANCE-01-12: Empowering citizens to monitor, report and act in partnership with relevant public authorities to protect their environment in the context of environmental compliance assurance

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply:

⁴⁵⁹ https://www.esa.int/Applications/Observing_the_Earth/FutureEO.

⁴⁶⁰ <https://eo4society.esa.int/communities/scientists/esa-ocean-science-cluster>.

⁴⁶¹ In particular HORIZON-CL6-2021-BIODIV-01-03 (Understanding and valuing coastal and marine biodiversity and ecosystems services); HORIZON-CL6-2021-BIODIV-01-04 (Assess and predict integrated impacts of cumulative direct and indirect stressors on coastal and marine biodiversity, ecosystems and their services) and HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems”.

	<p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p>
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Expected Outcome: A successful proposal will be contributing to the wide deployment of, and adding value to, environmental observations for ‘environmental compliance assurance’^{462, 463} by empowering citizens⁴⁶⁴ to promote, monitor, and act in partnership with relevant public authorities, thus contributing to the European Green Deal objectives (in particular to zero-pollution, protecting biodiversity and preventing deforestation).

Proposals are expected to contribute to all of the following outcomes:

- An increase in empowered citizens, communities and intermediaries that are equipped with guidance and tools to act on protecting their environment and increase awareness among citizens of environmental compliance;
- More relevant (*in-situ*) datasets and information, to be used in the context of policy shaping and the use of geospatial intelligence⁴⁶⁵ for environmental compliance assurance;
- Tested FAIR data governance and management mechanisms that enable the sharing, community validation and use of citizen generated data and information in combination with authoritative data and information as part of the European Green Deal Data Space;
- Better/larger engagement of citizens and communities with regional and local authorities to develop local actions for green and digital transformation (e.g., via the Living Labs for green digital solutions⁴⁶⁶) as well as Living Labs established in Missions, Partnerships and other initiatives.

Scope: Successful proposals are expected to support citizen engagement in particular by encouraging the validation and uptake of citizen observations by relevant public authorities for environmental compliance assurance. This includes the establishment of trusted data governance approaches in the context of the European Green Deal Data Space and, where

⁴⁶² https://ec.europa.eu/environment/legal/compliance_en.htm.

⁴⁶³ The three principal components of a compliance assurance system: compliance promotion, compliance monitoring, and enforcement against violations, Source: [ENSURING ENVIRONMENTAL COMPLIANCE – ISBN 978-92-64-05958-0 – © OECD 2009](#).

⁴⁶⁴ [Understanding the Citizen Science Landscape for European Environmental Policy: An Assessment and Recommendations](#).

⁴⁶⁵ Action 5. Being smart – using geo-spatial intelligence of the “[Endorsed work programme 2020-2022 to improve environmental compliance and governance](#)”, Environmental Compliance and Governance Forum.

⁴⁶⁶ [Join us in building the European way of Digital Transformation for 300 million Europeans | Living in EU \(living-in.eu\)](#).

possible, creating synergies with the citizen science development efforts of the Destination Earth initiative, and with the European Open Science Cloud (EOSC) European Partnership.

Capacity building for citizens, communities and intermediaries (training the trainer) to collect data and monitor their environment in addition to the data and information collected by other means of observation (statutory reporting, space-based, airborne, etc.), should be part of the proposal (e.g., through online or local learning and training modules), as well as awareness raising activities on environmental compliance assurance.

Digital and data technologies as key enablers

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE-01-13: Open source solutions for edge, cloud and mixed model applications to strengthen production and administrative capacities in agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: Due to the scope of this topic, legal entities established in non-associated third countries and/or regions are exceptionally eligible for Union funding. The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5-7 (according to the activity) by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: In line with the farm to fork strategy, the common agricultural policy post 2022, and the headline ambition of a digital age, the European strategy for data⁴⁶⁷ in particular, a successful proposal will contribute to transition to a fair, healthy and resilient agriculture. It will direct and/ or indirectly contribute to the enhancement of the sustainability performance of the sector and competitiveness in agriculture through supporting the further deployment of digital and data technologies as key enablers through research and innovation.

Project results are expected to contribute to all of the following expected outcomes:

- Enhanced sustainability performance and competitiveness of the sector, and a strengthened position of producers through tailored open-source digital solutions;
- Increased and enhanced use of digital tools in areas with weak connectivity;
- Improved energy balance of data-based solutions used in agricultural production;
- New approaches towards the development of software for the agriculture contributing to improving operational effectiveness and efficiency in the sector through real- time data processing;
- Facilitated deployment of digital applications for farmers and actors related to the agricultural sector;
- Decision-making support, particularly for policymakers, farm advisors, farmers, and public administration.

Scope: Digital and data technologies can improve the sustainability performance and competitiveness of the agricultural sector. There are still a number of factors hampering the uptake of digital technologies by farmers, including a lack of affordability of digital tools, a lack of digital skills and trust in data sharing, scepticism towards the “black box phenomenon” of digital applications and the lacking transparency in the development of algorithms, and the risk of vendor lock-ins. Digital solutions following the open-source principle can lead to reduced prices for digital applications and enhance transparency in production advice based on digital applications.

One frequent challenge to the use of certain digital technologies in agriculture, especially in remote areas, is weak connectivity, which hampers the full exploitation of their potential. Edge solutions may facilitate real-time applications also in areas with weak connectivity; they may, however, be run with less and/or other input data potentially resulting in another performance than cloud-based solutions or solutions following a mixed model of edge and cloud components. As data storage, processing and transfer goes along with energy consumption, the overall environmental performance of the different models for digital applications also varies and is also influenced by the number of users of a certain application.

⁴⁶⁷ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A European strategy for data ([EUR-Lex - 52020DC0066 - EN - EUR-Lex \(europa.eu\)](#))

This factor may influence the choice and or support for a certain digital application in agriculture.

Proposals should address the following:

- Development of open-source based digital applications for farmers following a dual and comparative approach with edge, cloud and mixed solutions under consideration of the potential of advanced Internet of Things (IoT) solutions; whereby the focus is on (remote) outdoor production processes, where frequently weak connectivity is given, as well as on reducing administrative burden for producers (TRL 5-7).
- Development of software solutions following an open-source principle involving (semi-professional) close-to-practice IT experts/ farmers and advisors with advanced digital skills to capitalise daily-work experiences and enhance user-orientation and increase digital capacities in the sector (TRL 5-7).
- Comparison of the performance of edge and cloud solutions in their effectiveness, efficiency and energy performance under consideration of various biogeographic and socio-economic framing conditions at farm and farm community level at regional and national scale.
- Development of a decision-making support tool, particularly targeting policymakers, farm advisors, farmers, and the public administration facilitating the comparing the performance of edge-, cloud-, and mixed model-based open source solutions for agriculture along several socio-economic and environmental parameters, including administrative capacities needed for their deployment, at the level of the farm, and the farm community at regional national scale.

Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various stakeholder groups, including farmers, farm advisors, IT experts and scientists are well reflected. Proposals should involve the effective contribution of social sciences and humanities (SSH) disciplines. This is required in particular to achieve a high level of user-friendliness of the developed applications and to develop accompanying training material for the different targeted user groups. Proposals are expected to take into consideration the results of other related Horizon 2020/ Europe projects as well as of other relevant EU funded projects and initiatives. When exploring opportunities to reduce administrative burdens for farmers, proposals should consider possibilities to facilitate reporting obligations and use production data for other processes along the value chain, e.g. marketing. Proposals are strongly encouraged to consider (evolving) technical solutions and (forthcoming) requirements⁴⁶⁸ in the field of data interoperability and switchability and to contribute to enhanced interoperability. In order to benefit from the experiences gained in the development of digital applications focused on within this topic and to foster the upscaling of

⁴⁶⁸ (Forthcoming) requirements in the fields of data interoperability and switchability may concern horizontal/ cross-sectoral or sector-specific provisions as well as legislation or voluntary regimes, such as code of conducts. For instance, the proposal for a Data Act, brought forward by the European Commission early 2022 may lead to requirements in those fields.

the outreach of the use of the developed digital applications, international cooperation is encouraged.

Proposals may involve financial support to third parties e.g. to academic researchers, hi-tech start-ups, SMEs, and other multidisciplinary actors, to, for instance, develop, test or validate developed applications. Consortia need to define the selection process of organisations, for which financial support may be granted. A maximum of 20% of the EU funding can be allocated to this purpose.

HORIZON-CL6-2023-GOVERNANCE-01-14: Digital and data technologies for livestock tracking

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁶⁹ .

Expected Outcome: In line with the farm to fork strategy, the headline ambition of a Digital Age – the EU data strategy strategy⁴⁷⁰ in particular - and the common agricultural policy (CAP), a successful proposal will support capacities to understand, develop and demonstrate the potential of digital and data technologies for livestock tracking in the public and private domains. It is therefore expected to indirectly support the enhancement of the sustainability performance and competitiveness in agriculture, the development of innovative governance models, and strengthened capacities for implementing, monitoring and evaluating common

⁴⁶⁹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁷⁰ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - A European strategy for data (see: [EUR-Lex - 52020DC0066 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/lexuri/cs.do?uri=CELEX:52020DC0066:EN:EUR-Lex)).

policies through research and innovation and through interlinking actors and relevant initiatives.

Project results are expected to contribute to all of the following expected outcomes:

- Strengthened sustainable livestock production through increased capabilities for the generation of livestock related data sets (including in the field on animal health and disease prevention);
- Strengthened the resilience and transparency of supply chains through the use of digital technologies;
- Enhanced capacities in policy monitoring and evaluation in the field of agriculture, environment, climate, and sustainable finance.

Scope: Data and digital technologies are currently used for many purposes in and for livestock farming, both in the public and private domains. Livestock and its attributes are tracked for instance in the context of implementing the CAP, for disease prevention and mitigation, as well as to facilitate production and the management of supply chains. Sensors, for instance, allow for collecting multiple information, e.g. on health conditions or medical treatments of livestock, location and environmental conditions. They may facilitate, e.g. more tailored and precise treatment of animals and to reduce inputs, of e.g. antibiotics, and costs. Livestock tracking may also e.g. support climate mitigation by assessing livestock density against land carrying capacity and reduce soil disturbance and compaction. It may also facilitate the provision of information to consumers on the products offered and enhance transparency along the supply chain and offer a means to against legal commitments of livestock densities, e.g. in the context of CAP strategic plans.

Frequently (public) registers are not interlinked and approaches towards data collection on livestock across Member States vary. Private sector efforts in livestock tracking are frequently not systemised and not scaled up. The potential for synergies between public and private sector initiatives in livestock tracking appears not to be fully explored and exploited.

Proposals should address the following:

- Elaborate on the potential for the generation of data sets through the development and applications of digital solutions to track livestock.
- Elaborate the opportunities of linking tracking efforts to sensor information providing information on animal health (and welfare) using the potential of innovative technologies;⁴⁷¹
- Develop concepts for data-based solutions for the private and public sector to track livestock and its conditions (including geospatial information) under consideration of multiple possible application cases, such as administrative purposes and legal

⁴⁷¹ A successful proposal may take advantage of the opportunity to integrate new phenotypes issued from tracking and sensors in certain breeding programmes.

commitments, labelling, predator and pest prevention; this activity should include an assessment of possible socio-economic and environmental effects, including the potential for reducing administrative costs and for policy monitoring, which could be achieved through the use of the data sets.

- Highlight the potential of and elaborate concepts for upscaling of data-based digital solutions for livestock tracking to EU (and international) level.
- Bring together key stakeholders from the public and private domain to explore – among others - opportunities to implement identified data-based and digital solutions, as well as to share data.

Proposals should consider existing and forthcoming data bases/ registers related to livestock as well as (forthcoming) sector-specific and horizontal legal requirements in the EU, including in the field of digital and data technologies. Proposals are expected to take stock of livestock tracking initiatives in the private domain, including in third countries and to draw lessons learnt, as well as of digital tracking technologies used in other sectors/ domains. Proposals are encouraged to explore interlinks with other innovative technologies, such as genomics, and application cases, such as recording breeding traits. Proposals are encouraged to reflect on the aspect of affordability of digital technologies as well as on the potential effects of livestock tracking for producers, food processors, and consumers. Proposals are encouraged to involve representatives of the public administration from all EU Member States and of relevant EU institutions,⁴⁷² as well as to link up to/ exchange with relevant EU funded projects, including projects funded under Horizon Europe and the Digital Europe Programme.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-GOVERNANCE-01-15: Digitalisation in agriculture and forestry: markets for data, and digital technologies and infrastructure – state of play and foresight in a fast changing regulatory, trade and technical environment

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Research and Innovation Actions

⁴⁷² Here, the involvement of representatives of all EU Member States and relevant EU institutions does not refer to the formation of the consortium but to the involvement of those actors in the work of the project. The European Commission can support a selected proposal in establishing contact to relevant EU institutions.

<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 3-5 by the end of the project – see General Annex B.
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Expected Outcome: In line with the European Green Deal, the farm to fork strategy in particular, and the headline ambition of a Digital Age, a successful proposal will support the capacities to understand and forecast the development of markets and the use of data and digital technologies in agriculture and forestry, particularly through the development of innovative assessment and modelling approaches. It will therefore support decreasing the risk of investing into digital infrastructure, and indirectly contribute to the enhancement of the sustainability performance and competitiveness in agriculture through further deployment of digital and data technologies as key enablers, and to the development of innovative governance models.

Project results are expected to contribute to all of the following expected outcomes:

- Analyses of global markets through innovative approaches including trends, potential barriers and risks associated with investments in data, digital and data technologies in the agriculture and forestry sectors.
- Increased transparency in data sharing and in the markets for digital and data technologies in the agricultural and forestry sectors in support of healthy competition.
- Contribution to an increased uptake of digital and data technologies in agriculture and forestry including through reduced investment risks; this is expected to indirectly contribute to an increase in environmental and economic performance of the sectors through increased and enhanced used of data, and digital and data technologies.
- Strengthened policy-making and -monitoring and foresight capacities.

Scope: The potential of digital and data technologies in the agricultural and forestry sectors to enhance their sustainability and economic performance and working conditions has been acknowledged. The uptake of digital technologies in the sectors and the development of supplementing data- and data-technology-based solutions in the EU are increasing. However, there is hardly comprehensive, independently collected data about the actual uptake and use of digital technologies by farmers and foresters, about the trade of sector-related data and digital technologies, and about the extent and structure of the provision of digital and data services in the agricultural and forestry supply chains, which are of global outreach.

At the same time, policies and the regulatory framework directly or indirectly influencing the deployment of digital and data technologies in the EU are evolving in a fast pace and will continue to do so.⁴⁷³ Also trade regimes are continuously changing. For stakeholder in the agricultural, forestry and the digital sectors to invest in digital and data technologies, it is important to be able to assess the possible implications of changing regulatory and market conditions on the development, purchase and use of data, and digital and data technologies.

⁴⁷³ See, e.g. the announcements in the Digital package published by the European Commission in February 2020: <https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy>.

This is also supported by an increase in information on markets and related actor networks, and information on the storage and the flows of goods and data, through increased transparency and a strengthened position of users and consumers. Such information as well as capacities in modelling and in carrying out foresight analyses for the development of markets and of the situation in the agricultural sector is also one pre-requisite for tailored policy-making.

Fostering the provision of insights into markets of data, and digital and data technologies in the agricultural and forestry sectors, the proposals should address the following:

- Development of innovative approaches to assess the uptake of digital technologies and digital infrastructure (incl. platforms) in the agricultural, and forestry sectors globally with special attention to the situation in the EU and Associated Countries.
- Development of innovative approaches to forecast the markets of data, digital technologies and digital infrastructure (including platforms) and the uptake of digital technologies globally with special attention to the situation in the EU under consideration of fast-changing regulatory framing conditions in the fields of data-, digital and machinery technologies and of agricultural and forestry policies.
- Demonstration of the qualitative and quantitative implications of market and technology trends in the fields of data, digital technologies and digital infrastructure for the use of digital and data technologies by farmers, foresters and other actors along the supply chains in a way that demonstration results can be steadily adapted to changing framing conditions. Demonstrations should allow for the reflection of scenarios and provide input to policy-making.

Project(s) are expected to consider innovation in digital technologies brought onto the market during the life-time of the project. It is expected that the project(s) are working with targeted stakeholders, including farmers, foresters, agri-businesses, farm advisors, policy-makers etc. to test demonstration and communication tools.

For the assessment of the uptake of digital technologies by farmers and foresters, statistical approaches evolving in the EU are to be considered, if applicable; assessment approaches may vary between continents.

In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-GOVERNANCE-01-16: Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a

<i>project</i>	proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 10.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.</p>

Expected Outcome: In line with the objectives of the biodiversity and farm to fork strategies, a successful proposal will contribute to transition to fair, healthy and resilient agriculture and forestry, notably the target to reduce by 50% the overall use and risk of chemical pesticides. Proposals will support Regulation (EU) 2016/2031⁴⁷⁴ on protective measures against plant pests.

Project results are expected to contribute to all of the following expected outcomes

- Increase the availability of large-scale and robust plant scanning methods to monitor plant pests, to assist territorial surveillance and help with timely eradication or optimisation of containment measures;
- Enhance innovative and cost-efficient integration of methods, including remote sensing and networks of traps that are available for surveillance of EU regulated plant pests affecting agriculture, forestry, other activities and areas (e.g., urban areas);
- Strengthen capacities to prevent entry and spread and to monitor EU regulated plant pests and support plant health territorial surveillance;
- Foster transdisciplinary cooperation in the fields of plant health, environmental sciences and earth observation.
- Support relevant EU and Associated Countries' plant health policies.

Scope: Pest monitoring is typically performed through costly and time-consuming on-site visits, resulting in certain cases in limited spatial and temporal resolution. Consequently, there is a need for more cost-effective approaches to detect and discriminate infested plants, including trees, at large spatial scales and within reasonable time frames. The advent of new

⁴⁷⁴ Regulation (EU) n. 2016/2031 (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031>) and Regulation (EU) n. 2019/2072 (https://eur-lex.europa.eu/eli/reg_impl/2019/2072/oj).

technology in remote sensing, sensor technologies, robotics, remotely piloted aerial systems (RPAS), the internet of things (IoT), and artificial intelligence (AI), opens opportunities for monitoring continuously, more widely, and remotely. These technologies have the potential to guide and help to target on site surveillance and early detection activities and other phytosanitary measures.

Proposals should:

- Develop and test early detection strategies by exploiting digital technologies, e.g., networks of sensors and remote sensing, to improve the surveillance efforts and the delimitation of affected areas by regulated pests allowing a regular and rapid monitoring of large areas that might be difficult to reach;
- Enhance and optimize the use of insect traps in a network setting for an IoT approach;
- Develop user-friendly and accessible tools or methods, including through the use of robotics to monitor a suite of known stress-processes in plants (chlorosis, changes in fluorescence, loss of transportation, etc.) that can be used in plant pest detection and/or to monitor occurrence of pests;
- Contribute to disentangle biotic and abiotic stresses, enabling the early detection of pests, by pushing further the current (and the new generation of satellite missions, e.g., FLEX⁴⁷⁵) capabilities of remote sensing (measurements taken by hand-held, towers, drones, and satellite data), AI, and other digital strategies;
- Collect standardised and comprehensive data (e.g., field observations, laboratory measurements, remotely sensed data, etc.) that contribute to monitor plant health and pests and to develop an early warning surveillance system;
- Assess the cost-benefits of the proposed methods;
- Integrate citizen science as a tool to monitor pests, developing robust methods to use its data for systematic analysis, and increasing public and stakeholder engagement.

Proposals should identify common standards and common indicators to collect data, as well as interoperability and metadata standards. Proposals should develop recommendations on how to make the best use and scale up digital technologies for plant pests early detection and territorial surveillance applications.

Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services, farming/forestry sectors, other relevant authorities, and industry are brought together.

Proposals should build on the results of relevant projects funded under Horizon 2020. Proposals should specify how they plan to collaborate with other proposals selected under this

⁴⁷⁵ <https://earth.esa.int/eogateway/missions/flex>.

and, if feasible, with other relevant topics⁴⁷⁶, e.g., by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS. Other data and services may be used in addition. All in-situ data collected through actions funded from this call should follow INSPIRE principles and be available through open access repositories supported by the European Commission (Copernicus, GEOSS).

This topic is part of a coordination initiative between ESA FutureEO programme for agriculture⁴⁷⁷ and the EC on Earth System Science. Applicants are encouraged to coordinate with the relevant ESA projects and in particular those of the ESA Agriculture Science Cluster Activities (agriculturesciencecluster.esa.int) in their proposals. Where relevant, creating links and using the information and data of the European Earth observation programme Copernicus are encouraged.

In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

HORIZON-CL6-2023-GOVERNANCE-01-17: Data-driven solutions to foster industry’s contribution to inclusive and sustainable food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.

Expected Outcome: This topic will enhance the sustainability performance and competitiveness in the domains covered by Cluster 6 through further deployment of digital and data technologies as key enablers. It will help to achieve better informed decision-making

⁴⁷⁶ HORIZON-CL6-2024-FARM2FORK-02-3-two-stage: Tools to increase the effectiveness of EU import controls for plant health

⁴⁷⁷ More details about relevant existing and planned ESA activities and projects can be found in <https://agriculturesciencecluster.esa.int>.

processes, social engagement, governance, and innovation. It will help deliver solutions to advance the European Green Deal priorities, the EU's climate targets for 2030 and 2050 and the farm to fork strategy for a fair, healthy and environmentally friendly food system. It will contribute to the food 2030 priorities: nutrition for sustainable healthy diets, climate, environment, circularity and resource efficiency, innovation and empowering communities and improving the data economy for food systems and enhance transparency.

There is already commitment in the private sector to drive change towards more sustainable food systems. One example is the “EU Code of Conduct on Responsible Food Business and Marketing Practices⁴⁷⁸”, an integral part of the farm to fork strategy. Many businesses have already signed the voluntary agreement⁴⁷⁹. This commitment also includes an R&I dimension that can be expanded to the respective topic.

Data-driven solutions in food systems also may support the European open data directive to share public data⁴⁸⁰ and foreseen data spaces⁴⁸¹ as well as provide a base of Artificial Intelligence (AI) deployment as enablers of the European Green Deal objectives.

Projects results are expected to contribute to all the following expected outcomes:

- Increased insights into the potential benefits and feasibility of data and technology employed by the private sector together with public stakeholders to drive sustainable food system transformation while respecting the relevant legal and policy frameworks;
- Enhanced transition towards sustainable healthy diets for all by using data driven solutions in the food sector.

Scope: Data are key to drive citizens’ sustainability practices. Several actors in the private food sector have access to valuable sustainability-related data, for example grocery retail, food processing and delivery services with huge potential to be used to foster the transition to sustainable food systems. At the same time, there is potential in mapping possible beneficial data not yet tested and a vision of a new spectrum of data overcoming availability bias. Data can be used to foster citizens’ sustainability practices, for example as a contributor to positively influence and monitor dietary changes. Industry contribution to the transition to sustainable food systems by engaging citizens in such transition can be very impactful while keeping the integrity of private intellectual property of the businesses. By democratizing data, private actors might gain a competitive advantage and activate other players to fulfil the need of transparency and proof of sustainability efforts for citizens.

Proposals are expected to address the following:

⁴⁷⁸ EU Code of Conduct on Responsible Food Business and Marketing Practices [f2f_sfpd_coc_final_en.pdf \(europa.eu\)](#), 2021.

⁴⁷⁹ https://single-market-economy.ec.europa.eu/news/farm-fork-strategy-65-companies-and-associations-sign-eu-code-conduct-responsible-food-business-and-2021-07-05_en.

⁴⁸⁰ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L1024&from=EN>

⁴⁸¹ [Digital Europe Work Programme 2021-2022](#).

- Analyse current systems of private data sharing in the food system (monetary incentives, actors involved...etc.);
- Initiate first tests of potential data sharing, also with SMEs and potentially start-ups, to identify potential impacts and benefits and serve as a lighthouse;
- Explore ‘new’ types of data and identify relevant data within the food system by also ‘unconventional players’ to tap into unused data sources, point out the main value pool for data sharing, outline potential needs of data gathering/harmonisation and map out an enhanced data framework and data collection strategy including needed technology (AI, Robotics, IoT) to drive sustainable food system transformation;
- Make use of analytics, forecast and AI to identify influential factors for making sustainable choices;
- Analyse the impacts on the sustainability of food systems of the proposed solutions considering the entire food supply chain and the different dimensions of sustainability;
- Define ways to use data to inform and guide consumer choices at the point of purchase in line with EU food law and policies;
- Set-up a potential framework for sharing non-competitive data that defines principles and collect good practices to foster sustainable food system objectives that ensures the protection of private data and sensitive business data and explore how this data can be integrated in the ‘Smart communities data space’⁵;
- Proposals must implement the 'multi-actor approach' and ensure adequate involvement of relevant stakeholders also in the health domain, such as doctors and nurses, and SMEs and start-ups;
- Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under this topic and under the topic 2022-GOVERNANCE-10 “Piloting approaches and tools to empower citizens to exercise their “data rights” in food and nutrition” and HORIZON-CL6-2024-FARM2FORK-01-8 “Preventing and reducing food waste to reduce environmental impacts and to help reach 2030 climate targets”;
- Include social innovation as the solution is at the socio-technical interface and requires social change, new social practices and social ownership;
- This topic should involve the effective contribution of SSH disciplines.

Strengthening agricultural knowledge and innovation systems (AKIS)

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE-01-18: Broaden EIP Operational Group outcomes across borders by means of thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁸² .

Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the farm to fork strategy objectives and targets, the successful proposals will focus on knowledge sharing in a language that is easy to understand and targeted to farmers and foresters. They will address the necessity of primary producers for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience. They will also speed up innovation and the uptake of results, and will be key to improving sustainability.

They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁴⁸³), thereby adding value to the knowledge and cost-effectiveness of innovative practices and

⁴⁸² This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁸³ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

techniques in and across primary production sectors, food and bioeconomy systems, and lead to more informed and engaged stakeholders and users of project results.

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not sufficiently captured and spread. The research findings are often not integrated into agricultural and forestry practice. The proposals, acting at EU level to remedy this, are essential because national and sectoral agricultural knowledge and innovation systems (AKISs) are insufficiently connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. This exchange of knowledge will foster economically viable and sustainable agriculture and forestry and build trust between the main AKIS actors. It will scale local solutions up to the EU level and may even influence policy design wherever useful.

Project results are expected to contribute to all of the following outcomes:

- Contribution to the cross-cutting objective of the CAP on modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁴⁸⁴, as well as to the European Green Deal and farm to fork Strategy objectives and targets.
- Collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, in particular the existing innovative solutions, best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners.
- Maintenance of practical knowledge in the long-term – beyond the project period – in particular by using the main trusted dissemination channels which farmers/foresters most often consult.
- Increased flow of practical information between farmers/foresters in the EU in a geographically balanced way, creating spill-overs and taking account of the differences between territories.
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge, by connecting actors, policies, projects and instruments to speed up innovation and promote the faster and wider co-creation and transposition of innovative solutions into practice.

Scope: Proposals should address the following activities:

- Build on the experiences and outcomes of at least 5 EIP-AGRI Operational Groups of at least 3 Member States and choose a common theme related to the themes of the 5 Operational Group projects.

⁴⁸⁴ Art 5 CAP post 2020 proposal.

- Tackle the most urgent needs of farmers and foresters. Collect, summarise, share and translate the existing knowledge from science and practice, resulting from the EIP operational Groups and beyond, in an easy-to-understand language for practitioners.
- Compile a comprehensive description of the state of current farming practices on the chosen theme to explain the added value of the proposal and the relevance of the theme. Proposals must focus on the cost/benefit aspects of the practices collected and summarised, and clarify how the project avoids duplication with ongoing or completed projects and networks.
- Deliver an extensive range of useful, applicable and appealing end-user material for farmers and foresters. This info should be easy to access and understand, and feed into the existing dissemination channels most consulted by farmers and foresters in the countries.
- Deliver as much audio-visual material and as many “practice abstracts” in the common EIP-AGRI format as possible, also including education and training materials.
- All materials should also be provided to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability' in the common 'practice abstract' format, as well as to national/regional/local AKIS channels and to the EU wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.
- In addition to giving the details on the EIP Operational Groups whose involvement is strongly recommended⁴⁸⁵, wherever possible and relevant to the chosen theme, provide also details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI.
- Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly activating farmers/foresters, farmers' groups and advisors and run for a minimum of 3 years.
- In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2023-GOVERNANCE-01-19: Thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a

⁴⁸⁵ According to the requirements of the multi-actor approach.

<i>project</i>	proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁸⁶ .

Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the farm to fork strategy objectives and targets, the successful proposals will focus on knowledge sharing in a language that is easy to understand and targeted to farmers and foresters. They will address the necessity of primary producers for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience.

They will also speed up innovation and the uptake of results, and will be key to improving sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁴⁸⁷), thereby adding value to the knowledge and cost-effectiveness of innovative practices and techniques in and across primary production sectors, food and bioeconomy systems, and lead to more informed and engaged stakeholders and users of project results.

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not sufficiently captured and spread. The research findings are often not integrated into agricultural and forestry practice. Proposals, acting at EU level to remedy this situation, are essential because national and sectoral AKISs are insufficiently

⁴⁸⁶ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁸⁷ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. This exchange of knowledge will foster economically viable and sustainable agriculture and forestry and build trust between the main AKIS actors.

Project results are expected to contribute to all of the following outcomes:

- Contribution to the cross-cutting objective of modernising the sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁴⁸⁸, as well as to the European Green Deal, including climate change mitigation or adaptation, and farm to fork strategy objectives and targets.
- Collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, in particular the existing innovative solutions, best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners.
- Maintenance of practical knowledge in the long-term – beyond the project period – in particular by using the main trusted dissemination channels that farmers/foresters most often consult.
- Increased flow of practical information between farmers/foresters in the EU in a geographically balanced way, creating spill-overs and taking account of the differences between territories.
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge, by connecting actors, policies, projects and instruments to speed up innovation and promote the faster and wider co-creation and transposition of innovative solutions into practice.

Scope: Proposals should address the following activities:

- Tackle the most urgent farmers' or foresters' needs by summarising, sharing and presenting – in a language that is easy to understand and is targeted to farmers and foresters – the existing best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners. The specific themes of the networks can be chosen in a 'bottom-up' way on the condition that they contribute to the relevant EU policy objectives, including climate mitigation and adaptation.
- Compile a comprehensive description of the state of current farming/forestry practices on the chosen theme to explain the added value of the proposal and the relevance of the theme. Proposals must focus on the cost/benefit aspects of the practices collected and summarised, and clarify how the project avoids duplication with ongoing or completed projects and networks.

⁴⁸⁸ Art 5 of the post 2020 CAP regulation.

- Deliver an extensive range of useful, applicable and appealing end-user material for farmers and foresters. This info should be easy to access and understand, making use of audio-visual material wherever possible, including also materials serving education and training and automatic translation services that allow dissemination beyond language barriers;
- This range of material should feed into the existing dissemination channels most consulted by farmers and foresters in the countries.
- As many “practice abstracts” in the common EIP-AGRI format as possible, as well as other types of materials should be provided to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability', as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24);
- Besides giving the details on the EIP Operational Groups whose involvement is strongly recommended⁴⁸⁹, wherever possible and relevant to the chosen theme, provide also details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI.
- Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly activating farmers/foresters, farmers' groups and advisors; and run for a minimum of 3 years.
- In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2023-GOVERNANCE-01-20: Developing an EU advisory network on organic agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 5.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must

⁴⁸⁹ According to the requirements of the multi-actor approach.

	use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁹⁰ .

Expected Outcome: A successful proposal will support the objectives of the European Green Deal, and notably its farm to fork and biodiversity strategies, and the sustainable carbon cycle communication, to transition to fair, healthy, climate and environmentally-friendly food systems from primary production to consumption, in particular the objective to promote organic farming in Europe. Activities will support the implementation of the action plan on the development of organic production⁴⁹¹ and of the common agricultural policy (CAP).

The successful proposal will focus on exchanges between farm advisors across the EU in order to increase the speed of knowledge creation and sharing, capacity building, demonstration of innovative solutions in organic farming, as well as helping to bring them into practice in order to accelerate adoption of these solutions.

Project results are expected to contribute to all of the following outcomes:

- Accelerated progress towards achieving the policy objectives linked to the farm to fork strategy’s target on organic farming, and in particular those identified under the Action Plan on the Development of Organic Production, as well as the new CAP;
- Supported implementation in Member States of the CAP’s cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁴⁹²;
- Enhanced interactions among advisors and other relevant actors in the EU and Associated Countries conducive to a strengthened research and innovation ecosystem for organic farming;
- Increased provision of supporting services and materials that facilitate the conversion to and upscaling of organic farming;

⁴⁹⁰ This [decision](#) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁴⁹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>

⁴⁹² Art 5 CAP post 2020 proposal.

- Accelerated introduction, spread and implementation in practice of innovative solutions related to organic farming leading to improved production methods of organic farms.

Scope: Agricultural Knowledge and Innovation Systems (AKIS)⁴⁹³, in which advisors play a central role, are key drivers to speed up innovation and the uptake of research results by farmers. Transformative changes such as the ones called for by the farm to fork strategy, are dynamic and knowledge-intensive processes that require appropriate governance of AKIS actors. Advisors play a key role in steering and influencing farmers' decisions. A novelty in the post-2020 CAP plans⁴⁹⁴ is that advisors must be integrated within the Member States' AKIS, and that the scope of their actions has become much broader. Advisors must be able to cover the economic, environmental and social domains, as well as being up-to-date on scientific and innovation developments. They should be able to translate this knowledge into concrete opportunities for the end users, and adapt those to specific local circumstances.

This topic focuses on the important role that advisors can play in relation to boosting organic farming towards reaching the target of at least 25% of the EU's agricultural land under organic farming by 2030. In particular, advisors can play a key role in encouraging conversion to organic farming and in facilitating this process to farmers, and overall in tackling the challenges of organic farming. In this context, advisors are in a good position to provide hands-on training to organic farmers, to inspire new and incoming farmers or farms at the cross-roads of intergenerational renewal, to connect with education and ensure broad communication, to support peer-to-peer consulting, and to develop on-farm demonstrations.

Proposals should set up an EU advisory network dedicated to organic farming, covering both organic plant production systems and organic animal husbandry. The network should involve participants from at least 20 EU Member States, including countries in which the organic sector is more developed and less developed. In this context, proposals should:

- Connect farm advisors across the EU, with a view to sharing experiences on how to best tackle the main issues of the sector.
- Undertake knowledge, best practice and innovation exchange activities that support Member States in making the best use of the possibilities offered by the new CAP to support their national organic sector.
- Fill gaps on emerging advisory topics beyond the classical sectorial advice, in particular in view of the new obligation for Member States to integrate advisors within their AKIS.
- Serve as a platform to bring stakeholders together to discuss challenges and solutions to practical organic farming problems, such as bottlenecks, lock-ins, power imbalances, normative aspects, lack of consumer buy-in or trust, inequalities between Member States, etc.;

⁴⁹³ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

⁴⁹⁴ Art 13(2) of the post 2020 CAP regulation.

- Provide overall support related to knowledge creation, organisation and sharing. This could include peer-to-peer counselling, master classes, (digital) advice modules, communication and education materials, etc.
- Promote the sharing of effective and novel approaches that are sustainable in terms of economic, environmental and social aspects.
- Create added value by ensuring stronger links between research, education, advisors and farming practice and encouraging the wider use of available knowledge across the EU.
- Spread ready-to-use innovative solutions to practitioners and ensuring communication to the scientific community of research needs from practice.
- Taking strong account of cost-benefit elements, collect and document good examples of connecting farmers, intermediates and consumers in Member States to be able to take into account financial aspects and local conditions. Select the best practices, and extract lessons about the key success factors, possible quick wins and make them available for (local) exploitation.
- Promote the integration of the advisors of the EU advisory network on organic farming into their Member State's AKIS.
- Explore if the activities of the EU advisory network on organic farming can be up scaled at the level of a number of Member States under a cooperative format. Seek if common tools can be created to incentivise the implementation of the learnings from this project.
- Organise training activities for new advisors to be integrated in the network during the course of the project.
- In the EU advisory network, use local AKIS connections which can more accurately interpret the national/regional contexts to help develop the best solutions for that Member State or region. Use the support of the Member States' knowledge and innovation experts of the SCAR-AKIS Strategic Working Group and of the SCAR Agroecology Strategic Working Group⁴⁹⁵ to discuss project strategy and progress in the various stages of the project.

Outcomes should be spread beyond the organic farming communities and reach also farmers involved in conventional, carbon, low-input, circular agriculture or agroecology. Proposals must implement the multi-actor approach, with a majority of partners being organic farming advisors with solid field experience. Proposals should capitalise and build on the outputs of relevant EIP-AGRI Operational Groups and EIP-AGRI networking activities, as well as those of the Horizon 2020 Thematic Networks related to organic farming. Proposals should dedicate a task, appropriate resources and a plan on how they will ensure synergy with and take into consideration the results of other initiatives under Horizon Europe, including the projects selected under the topics HORIZON-CL6-2021-FARM2FORK-01-01: 'Reaching the farm to

⁴⁹⁵ <https://scar-europe.org/agroecology-mission-and-aims>

fork target: R&I scenarios for boosting organic farming and organic aquaculture in Europe’, and HORIZON-CL6-2021-BIODIV-01-14: ‘Fostering organic crop breeding’ in the Horizon Europe Work Programme 2021-2022. Proposals should also dedicate appropriate resources to ensure synergies with the activities carried out by projects selected under the following topics in this work programme: HORIZON-CL6-2024-FARM2FORK-02-1-two-stage: ‘Increasing the availability and use of non-contentious inputs in organic farming’, and HORIZON-CL6-2023-FARM2FORK: ‘Improving yields in organic cropping systems’, HORIZON-CL6-2023-CLIMATE-01-5: ‘Pilot network of climate-positive organic farms’, as well as coherence and synergies with the activities of the future partnership ‘Accelerating farming systems transition: agroecology living labs and research infrastructures’. Proposals should provide all outcomes and materials to the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI), including in the common 'practice abstract' format for EU wide dissemination, as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.

HORIZON-CL6-2023-GOVERNANCE-01-21: Developing EU advisory networks to reduce the use of pesticides

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁹⁶ .
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Expected Outcome: In support of the European Green Deal, common agricultural policy (CAP), farm to fork and biodiversity strategies', the zero pollution action plan objectives and targets, and the sustainable carbon cycles communication, the successful proposal will focus on advisor exchanges across the EU in order to increase the speed of knowledge creation and sharing, capacity building, demonstration of innovative solutions, as well as helping to bring them into practice, which accelerates the needed transitions. Agricultural Knowledge and Innovation Systems (AKIS), in which advisors play a central role, are key drivers to speed up innovation and the uptake of research results by farmers.

Transformative changes such as the changes required within the European Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors with a strong role in guiding and with a big influence on producers' decisions. A novelty in the post-2020 CAP plans⁴⁹⁷ is that advisors must now be integrated within the Member States' AKIS, and that the scope of their actions has become much broader. They must be able to cover economic, environmental and social domains, as well as be up-to-date on science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt this knowledge to specific local circumstances. This specific topic focuses on the important role advisors can play in relation to reducing pesticide use and risks to reach the associated target of the farm to fork and biodiversity strategies by promoting, for example, more sustainable farming techniques (e.g., integrated pest management and agroecology), carbon farming practices, and the use of non-chemical or biological methods for pest control.

Project results are expected to contribute to the following outcomes:

- Progress towards the most urgent policy objectives linked to Cluster 6, as well as the European Green Deal, and in particular the farm to fork strategy, the new CAP, and the sustainable carbon cycles communication, with a view to increasing the sustainability of farming, helping to raise awareness and tackling societal challenges, including climate change, and helping to reduce pesticide risks and use;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁴⁹⁸;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to the reduction of pesticide use and the associated risks

⁴⁹⁶ This [decision](#) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

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Art 13(2) of the post 2020 CAP regulation.

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Art 5 CAP post 2020 proposal.

in practice, such as bottlenecks, lock-ins, political inertia, ambiguous regulations, inequality between Member States and power imbalances;

- Production of supporting services and materials to facilitate the reduction of pesticide use and risk, including knowledge networks and peer-to-peer counselling, master classes, advice modules, communication and education materials, effective business models for farm management with less pesticides, and other risk mitigation tools and measures, etc.;
- Speed up of the introduction, spread and implementation in practice of innovative solutions related to pesticide use and measures to reduce risks and pollution overall, in particular by:
 - a. creating added value by better linking research, education, advisors and farming practice and encouraging the wider use of available knowledge across the EU;
 - b. learning from innovation actors and projects, resulting in faster sharing and implementation of ready-to-use innovative solutions, spreading them to practitioners and communicating to the scientific community the bottom-up research needs of practice.

Scope: Proposals should address the following activities:

- Connect advisors possessing a broad and extensive network of farmers across all EU Member States in an EU advisory network dedicated to pesticide use and risk reduction, including farming techniques which support pesticide use and risk reduction, with a view to sharing experiences on how to best tackle the issues, building on the outcomes of the EIP-AGRI Focus Groups and Workshops as well as the Horizon 2020 Thematic networks related to pesticide use and risks reduction;
- Share effective and novel approaches among the EU advisory network on pesticide use and risk reduction, which are sustainable in terms of economic, environmental and social aspects;
- Fill gaps on emerging advisory topics beyond the classical sectoral advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS and their obligation to cover a much broader scope than in the past;
- Provide overall support related to knowledge creation, organisation and sharing;
- Take strong account of cost-benefit elements. Collect and document good examples in this regard, connecting with farmers, intermediates and consumers in Member States to be able to take into account financial aspects and local conditions. Select the best practices, learn about the key success factors, possible quick wins and make them available for (local) exploitation, to ensure financial win-wins for producers, citizens and intermediate actors;

- Integrate the advisors within the EU pesticide use and risk reduction network into their MS AKIS as much as possible. As innovation brokers they should encourage innovative projects on organic and other low-input sustainable farming systems in EIP Operational Groups. They should give hands-on training to farmers and local advisors, lead national thematic and learning networks on the subject, deliver and implement action plans to make farming systems with a reduced use of chemical pesticides, more efficient, reduce farmers' yield losses, inspire new and incoming farmers or farms at the cross-roads of intergenerational renewal, connect with education and ensure broad communication, support peer-to-peer consulting, develop on-farm demonstrations and demo films distributed widely via social media, and provide specific back-office support for generalist advisors within the national/regional AKIS;
- Explore if the activities of the EU advisory network on pesticide use and risk reduction can be scaled up at the level of a number of Member States under a cooperative format. Wherever possible, develop digital advisory tools for common use across the EU. Determine whether common tools can be created to incentivise the implementation of the learnings from this project;
- Include all 27 EU Member States in the EU advisory network, using local AKIS connections which can more accurately interpret the national/regional contexts to help develop the best solutions for that Member State or region. Use the support of the Member States' knowledge and innovation experts of the SCAR-AKIS Strategic Working Group to discuss project strategy and progress in the various stages of the 2 projects;
- Projects should run at least 5 years. They must implement the multi-actor approach, with a majority of partners being farming advisors with solid field experience;

Proposals must implement the multi-actor approach, with a majority of partners being farming advisors active in pesticide use and with substantial field expertise. Proposals should capitalise and build on the outputs of relevant EIP-AGRI Operational Groups, EIP-AGRI Focus Groups and EIP-AGRI networking activities, as well as those of the Horizon 2020 Thematic Networks related to plant health and pesticide use. Proposals should also build on the results of past/ongoing research projects and thematic networks.

Proposals should also ensure synergies with the activities carried out by projects selected under the following topics in this work programme: 'HORIZON-CL6-2023-BIODIV-01-14: Biodiversity friendly practices in agriculture – breeding for Integrated Pest Management (IPM)', 'HORIZON-CL6-2023-FARM2FORK-01-7: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution', and 'HORIZON-CL6-2023-GOVERNANCE-01-20: Developing an EU advisory network on organic agriculture' as well as coherence and synergies with the activities of the future partnership 'Accelerating farming systems transition: agroecology living labs and research infrastructures'. Proposals should provide all outcomes and materials to the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI), including in

the common 'practice abstract' format for EU wide dissemination, as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.

HORIZON-CL6-2023-GOVERNANCE-01-22: Developing EU advisory networks on the optimal fertiliser use

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁴⁹⁹ .

Expected Outcome: In support of the European Green Deal, common agricultural policy (CAP), and biodiversity strategies', the zero pollution action plan objectives and targets, and the sustainable carbon cycles communication, the successful proposal will focus on advisor exchanges across the EU in order to increase the speed of knowledge creation and sharing, capacity building, demonstration of innovative solutions, as well as helping to bring them into practice, which accelerates the needed transitions. Agricultural Knowledge and Innovation Systems (AKIS), in which advisors play a central role, are key drivers to speed up innovation and the uptake of research results by farmers.

⁴⁹⁹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Transformative changes such as the changes required within the European Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors with a strong role in guiding and with a big influence on producers' decisions. A novelty in the post-2020 CAP plans⁵⁰⁰ is that advisors must now be integrated within the Member States' AKIS, and that the scope of their actions has become much broader. They must be able to cover economic, environmental and social domains, as well as be up-to-date on science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt this knowledge to specific local circumstances. This specific topic focuses on the important role advisors can play in relation to the soaring fertilizer prices and the ambition of the farm to fork and biodiversity strategies for 2030 to reduce nutrient losses to the environment from both organic and mineral fertilizers by at least 50%; and hence reduce the use of fertilisers by at least 20%, while ensuring no deterioration in soil fertility.

Project results are expected to contribute to the following outcomes:

- Progress towards the most urgent policy objectives linked to Cluster 6, as well as the European Green Deal, and in particular the farm to fork strategy, the new CAP, the sustainable carbon cycles communication, with a view to increasing the sustainability of farming, helping to raise awareness and tackling societal challenges, including climate change, and helping to reduce nutrient losses and thereby the use of fertilisers;
- Substitution of mineral fertilisers with sustainable, affordable high-quality bio-based alternatives from different residue and waste streams;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁵⁰¹;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to the reduction of nutrient losses and the use of fertilisers in practice, such as bottlenecks, lock-ins, political inertia, ambiguous regulations, inequality between Member States and power imbalances;
- Production of supporting services and materials to facilitate the reduction of nutrient losses and the use of fertilisers, including knowledge networks and peer-to-peer counselling, master classes, advice modules, communication and education materials, effective business models for farm management with less fertilisers, and other risk mitigation tools and measures, etc.;
- Speed up of the introduction, spread and implementation in practice of innovative solutions related to fertiliser use and measures to reduce nutrient losses overall, in particular by:

⁵⁰⁰ Art 13(2) of the post 2020 CAP regulation.

⁵⁰¹ Art 5 CAP post 2020 proposal.

- a. creating added value by better linking research, education, advisors and farming practice and encouraging the wider use of available knowledge across the EU;
- b. learning from innovation actors and projects, resulting in faster sharing and implementation of ready-to-use innovative solutions, spreading them to practitioners and communicating to the scientific community the bottom-up research needs of practice.

Scope: Proposals should address the following activities:

- Connect advisors possessing a broad and extensive network of farmers across all EU Member States in an EU advisory network dedicated to the reduction of nutrient losses and optimal use of fertilisers, including bio-based fertilisers and farming techniques which support a sustainable nutrient management, including carbon farming, with a view to sharing experiences on how to best tackle the issues, building on the outcomes of the related EIP-AGRI focus groups and workshops as well as the Horizon 2020 projects and thematic networks.
- Share among the EU advisory network effective and novel approaches to the reduction of nutrient losses and the use of fertilisers, which are sustainable in terms of economic, environmental and social aspects.
- Fill gaps on emerging advisory topics beyond the classical sectoral advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS and their obligation to cover a much broader scope than in the past.
- Provide overall support related to knowledge creation, organisation and sharing.
- Take strong account of cost-benefit elements. Collect and document good examples in this regard, connecting with farmers, intermediates and consumers in Member States to be able to take into account financial aspects and local conditions. Select the best practices, learn about the key success factors, possible quick wins and make them available for (local) exploitation, to ensure financial win-wins for producers, citizens and intermediate actors.
- Integrate the advisors within the EU network on the reduction of nutrient losses and the use of fertilisers into their MS AKIS as much as possible. As innovation brokers they should encourage innovative projects on low-input sustainable farming systems in EIP Operational Groups. They should give hands-on training to farmers and local advisors, lead national thematic and learning networks on the subject, deliver and implement action plans to make farming activities more efficient, reduce farmers' yield losses, inspire new and incoming farmers or farms at the cross-roads of intergenerational renewal, connect with education and ensure broad communication, support peer-to-peer consulting, develop on-farm demonstrations and demo films distributed widely via social media, and provide specific back-office support for generalist advisors within the national/regional AKIS.

- Explore if the activities of the EU advisory network on the reduction of nutrient losses and use of fertilisers can be scaled up at the level of a number of Member States under a cooperative format. Wherever possible, develop digital advisory tools for common use across the EU. Determine whether common tools can be created to incentivise the implementation of the learnings from this project.
- Include all 27 EU Member States in the EU advisory network, using local AKIS connections which can more accurately interpret the national/regional contexts to help develop the best solutions for that Member State or region. Use the support of the Member States’ knowledge and innovation experts of the SCAR-AKIS Strategic Working Group to discuss project strategy and progress in the various stages of the 2 projects.
- Projects should run at least 5 years. They must implement the multi-actor approach, with a majority of partners being farming advisors with solid field experience.
- Provide all outcomes and materials to the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI), including in the common 'practice abstract' format for EU wide dissemination, as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.

Proposals must implement the multi-actor approach, with a majority of partners being farming advisors active in fertiliser use and with frequent field expertise. Proposals should capitalise and build on the outputs of relevant EIP-AGRI Operational Groups, EIP-AGRI Focus Groups and EIP-AGRI networking activities, as well as those of the Horizon 2020 Thematic Networks related to the reduction of nutrient losses and the use of fertilisers. Proposals should also build on the results of past/ongoing research projects and thematic networks.

Call - Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2023-GOVERNANCE-02

Conditions for the Call

Indicative budget(s)⁵⁰²

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project	Indicative number of

⁵⁰² The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.
The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

		2023	(EUR million) ⁵⁰³	projects expected to be funded
Opening: 25 May 2023 Deadline(s): 21 Sep 2023				
HORIZON-CL6-2023-GOVERNANCE-02-1	CSA	4.00	Around 4.00	1
Overall indicative budget		4.00		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Innovating with governance models and supporting policies

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE-02-1: Supporting the All-Atlantic Ocean Research and Innovation Alliance and Declaration

Specific conditions

⁵⁰³ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If eligible for funding, legal entities established in non-associated third countries may exceptionally participate in this Coordination and support action as beneficiary or affiliated entity.</p> <p>Due to the scope of this topic, legal entities established in Brazil are exceptionally eligible for Union funding.</p> <p>The following additional eligibility criteria apply: In order to achieve the expected outcomes of the action, namely the European contribution to the implementation of the All-Atlantic Ocean Research & Innovation Alliance, participation, as a beneficiary or associated partner, of at least three legal entities established in at least three of the following countries is required: Argentina, Brazil, Canada, Cape Verde, Morocco, United States of America, South Africa.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).⁵⁰⁴.</p>

Expected Outcome: Proposals are expected to contribute to all of the following expected outcomes:

- Support the coordination of marine and maritime research and innovation activities with Atlantic Ocean stakeholders, integrating the North and South Atlantic dimension, aligned with the priorities identified in the 2022 All-Atlantic Ocean Research and Innovation Alliance (AAORIA) Declaration, with the aim of facilitating knowledge

⁵⁰⁴ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

exchange, structure its integration as well as stimulating all forms of innovation, in view of providing benefit to local communities;

- Consolidated integration of partners and newcomers to the All-Atlantic Ocean Research and Innovation Alliance and enhanced visibility to the activities through targeted communication actions and coordination of visual identity;
- Support to the governance, implementation and reporting of the All-Atlantic Ocean Research and Innovation Alliance;
- Forged links and coordination with other important EU and international activities such as the European Mission Restore Our Ocean and Waters by 2030, and in particular its Atlantic-Arctic Lighthouse, the Horizon Europe Partnership for a Sustainable Blue Economy, and organisations in charge of protection of the marine and coastal environment in the Atlantic, such as the OSPAR and Abidjan Conventions, in delivering coordinated activities in the Atlantic Sea Basin, while ensuring its interlinks with the adjacent polar areas;
- Foster active contribution from the All-Atlantic Ocean Research and Innovation Alliance to achieving the goals of the UN Decade of Ocean Science for Sustainable Development 2021-2030, the UN Decade on Ecosystem Restoration, the Convention on Biological Diversity, to Marine Biodiversity of Areas Beyond National Jurisdiction (BBNJ), as well as G7 and G20 related activities;
- Facilitated synergies in youth and gender programmes and capacity development for early career professionals; educational and inter-generational activities in favour of youth and communities living on the shores of the Atlantic Ocean.

Scope: The actions should aim at supporting a wider understanding of the opportunities and promoting a sustainable management of the Atlantic Ocean as a whole, through a large-scale basin effort involving both the northern and the southern parts of this ocean, and its interlinks with the adjacent polar areas. To achieve this, it will be necessary to bring together and systematically connect scientists, a wide range of public and private stakeholders, including civil society and youth, with data, knowledge, expertise, capacities, infrastructures and resources.

Building on the pre-existing cooperative efforts under the Galway and Belém Statements and the existing and future bilateral administrative arrangements between the EU and Atlantic partner countries, this cooperation can continue to converge towards the implementation of a systemic approach by linking and jointly tackling the climate-food-ocean challenges, including extreme events and sea level rise. Overall, activities should contribute to upscaling cooperation along and across the Atlantic Ocean, including the specific on-going and future activities and initiatives related to the Arctic and Antarctica. They should include upscaling of long-term partnerships building also on on-going initiatives such as the All-Atlantic Ocean Youth Ambassadors, joint actions, working groups, pledging platform, etc, for the benefit of the All-Atlantic local communities. This action is expected to bring research and innovation

results for their benefit and to also empower for and link early career professional to all these activities.

The action should:

- Contribute with professional support to the organization, monitoring, communication, and outreach activities of the All-Atlantic Ocean Research and Innovation Alliance and Innovation work, in particular to the annual All-Atlantic Ocean Research and Innovation Alliance Forum, and any other major relevant events;
- Consolidate existing initiatives (All-Atlantic Ocean Youth Ambassadors, joint actions, working groups, etc.) building on the outcomes of the 2022 AAORIA Fora. Continue providing basic support for joint activities (in particular in their initial phase) in the priority areas identified in the 2022 All-Atlantic Ocean Research and Innovation Alliance Declaration, ensuring their long-term self-sustainability;
- Facilitate a structured dialogue and coordination between the All-Atlantic Ocean Research and Innovation Alliance and relevant national and regional stakeholders, such as the Benguela Current Commission, the Abidjan Convention, indigenous communities, as well as networks and initiatives operating in the polar seas;
- Link with relevant international bodies, supporting the All-Atlantic contributions to the UN Decade of Ocean Science, and facilitating dialogue and synergies with other EU instruments (e.g., Mission Restore our Ocean and Waters, Mission Adaptation to Climate Change, and the Sustainable Blue Economy Partnership) relevant for the All-Atlantic work, is part of the activities to be undertaken under this action.

Proposals should include a strong involvement of citizens/civil society, together with academia/research, industry/SMEs and government/public authorities.

In order to achieve the expected outcomes, international cooperation is mandatory. Consortia submitting proposals to this topic are encouraged to include in particular participants from countries endorsing the All-Atlantic Ocean Research and Innovation Alliance Declaration.

Call - Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2024-GOVERNANCE-01

Conditions for the Call

Indicative budget(s)⁵⁰⁵

⁵⁰⁵ The Director-General responsible for the call may decide to open the call up to one month prior to or after the envisaged date(s) of opening.
The Director-General responsible may delay the deadline(s) by up to two months.
All deadlines are at 17.00.00 Brussels local time.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million) ⁵⁰⁶	Indicative number of projects expected to be funded
		2024		
Opening: 17 Oct 2023 Deadline(s): 28 Feb 2024				
HORIZON-CL6-2024-GOVERNANCE-01-1	COFUND	60.00	Around 60.00	1
HORIZON-CL6-2024-GOVERNANCE-01-10	CSA	4.00	Around 4.00	1
HORIZON-CL6-2024-GOVERNANCE-01-11	CSA	3.00	Around 3.00	1
HORIZON-CL6-2024-GOVERNANCE-01-12	CSA	4.00	Around 4.00	1
HORIZON-CL6-2024-GOVERNANCE-01-13	CSA	4.00	Around 4.00	1
HORIZON-CL6-2024-GOVERNANCE-01-2	CSA	3.50	Around 3.50	1
HORIZON-CL6-2024-GOVERNANCE-01-3	CSA	3.00	Around 3.00	1
HORIZON-CL6-2024-GOVERNANCE-01-5	PCP	19.00	Around 19.00	1
HORIZON-CL6-2024-GOVERNANCE-01-6	RIA	8.00	Around 4.00	2
HORIZON-CL6-2024-GOVERNANCE-01-7	RIA	15.00	Around 5.00	3
HORIZON-CL6-2024-GOVERNANCE-01-8	CSA	4.00	Around 2.00	2

The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

⁵⁰⁶ Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

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HORIZON-CL6-2024-GOVERNANCE-01-9	CSA	6.00	Around 3.00	2
Overall indicative budget		133.50		

General conditions relating to this call	
<i>Admissibility conditions</i>	The conditions are described in General Annex A.
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Financial and operational capacity and exclusion</i>	The criteria are described in General Annex C.
<i>Award criteria</i>	The criteria are described in General Annex D.
<i>Documents</i>	The documents are described in General Annex E.
<i>Procedure</i>	The procedure is described in General Annex F.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G.

Innovating with governance models and supporting policies

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-GOVERNANCE-01-1: Additional activities for the European Partnership for a climate neutral, sustainable and productive Blue Economy

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 60.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 60.00 million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility</i>	The conditions are described in General Annex B. The following

<p><i>conditions</i></p>	<p>exceptions apply:</p> <p>The proposal must be submitted by the coordinator of the consortium funded under HORIZON-CL6-2022-GOVERNANCE-01-02: European Partnership for a climate neutral, sustainable and productive Blue Economy. This eligibility condition is without prejudice to the possibility to include additional partners.</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.</p> <p>The following additional eligibility criteria apply: Proposals focusing on one type of activity or sector are out of scope.</p>
<p><i>Procedure</i></p>	<p>The procedure is described in General Annex F. The following exceptions apply:</p> <p>The evaluation committee will be composed partially by representatives of EU institutions.</p> <p>If the proposal is successful, the next stage of the procedure will be grant agreement amendment preparations.</p> <p>If the outcome of amendment preparations is an award decision, the coordinator of the consortium funded under HORIZON-CL6-2022-GOVERNANCE-01-02: European Partnership for a climate neutral, sustainable and productive Blue Economy will be invited to submit an amendment to the grant agreement, on behalf of the beneficiaries.</p>
<p><i>Legal and financial set-up of the Grant Agreements</i></p>	<p>This action is intended to be implemented in the form of an amendment of the grant agreement concluded pursuant to topic HORIZON-CL6-2022-GOVERNANCE-01-02.</p> <p>For additional activities covered by this action:</p> <ul style="list-style-type: none"> • The funding rate is 30% of eligible costs. • Beneficiaries may provide financial support to third parties (FSTP). The support to third parties can only be provided in the form of grants. • Financial support provided by the participants to third parties is one of the primary activities of this action in order to be able to achieve its objectives. The 60 000 EUR threshold provided for in Article 204 (a) of the Financial Regulation No 2018/1046 does not

	<p>apply.</p> <ul style="list-style-type: none"> • The maximum amount of FSTP to be granted to each third party is EUR 10 000 000. This amount is justified since the provision of FSTP is one of the primary activities of this action and it is based on extensive experience under predecessors of this partnership. • The starting date of grants awarded under this topic may be as of the submission date of the application. Applicants must justify the need for a retroactive starting date in their application. Costs incurred from the starting date of the action may be considered eligible (and will be reflected in the entry into force date of the amendment to the grant agreement).
<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR 150 million.

Expected Outcome: This topic is for the continuation of the Sustainable Blue Economy Partnership (SBEP), i.e. EU contribution in WP 2023-2024.

The second instalment of the partnership is expected to contribute to all expected outcomes specified in topic HORIZON-CL6-2022-GOVERNANCE-01-02: European Partnership for a climate-neutral, sustainable and productive Blue Economy, for continuation and new development of activities.

Scope: The objective of this action is to continue to provide support to the European Partnership for a climate-neutral, sustainable and productive Blue Economy (SBEP) identified in the Horizon Europe Strategic Plan 2021-2024 and first implemented under the topic HORIZON-CL6-2022-GOVERNANCE-01-02: European Partnership for a climate neutral, sustainable and productive Blue Economy, and in particular to fund additional activities (which may also be undertaken by additional partners) in view of its intended scope and duration, and in accordance with Article 24(2) of the Horizon Europe Regulation.

The consortium which applied to and received funding under HORIZON-CL6-2022-GOVERNANCE-01-02 is uniquely placed to submit a proposal to continue the envisioned partnership. Not only did this consortium submit the proposal leading to the identification of the partnership in the Horizon Europe strategic planning 2021-2024, it has also implemented the partnership through co-funded calls in year 2022 based on this planning and further to topic HORIZON-CL6-2022-GOVERNANCE-01-02. In this context, the current consortium has particular expertise in relation to the objectives of the Partnership, the activities to be implemented, in particular FSTP calls or other calls/scope of calls clearly required/envisioned pursuant to initial proposal/partnership, and other relevant aspects of the action. In practice, another consortium could not continue the activities of the Partnership underway without significant disruption to the ongoing activities, if at all.

The scope of the application for this call on the European partnership for a climate neutral, sustainable and productive Blue Economy should focus on duly justified continuation or additional priority areas, additional activities and additional partners, including from additional countries, delivering knowledge and solutions to make the blue economy sustainable and ensure that its benefits are distributed fairly, by aligning national, regional and EU R&I priorities and bringing together science, industry, governance and society.

Responding to national and EU policy goals (e.g., European Green Deal, Marine Strategy and Water Framework Directive, Natura and Maritime Spatial Planning Directives), the partnership's continued and/or additional priority areas should aim to achieve a healthy ocean, a sustainable and productive blue economy and the well-being of citizens, for which the long-term vision for the EU's rural areas and its objectives (in particular contributing to stronger and resilient rural (coastal) areas) should also be considered, with its flagship initiative "Research and innovation for rural (coastal) communities".

The partnership is expected to continue to organise joint calls as part of the additional activities and therefore it should factor ample time to run the co-funded projects. The partnership should further promote technological, nature-based, social, economic and cultural innovation and experiment with new planning, governance, business and finance models.

The partnership's additional activities are expected to be designed and described in such a way that it is clear how they will increase scientific contributions, applicable in a legal/regulatory context, and how they will facilitate the use of scientific knowledge by regulators and policymakers, contributing to the EU biodiversity strategy for 2030, the farm to fork strategy, the mission "Restore our Ocean and Waters by 2030", the circular economy action plan, the zero pollution ambition and the transformation of Europe's blue economy towards climate-neutral status by 2050, as also reflected in the communication on a new approach for a sustainable blue economy in the EU "Transforming the EU's Blue Economy for a Sustainable Future".

The partnership is also expected to have a structuring function with regard to European integrated ocean observing systems and data analyses. The partnership is expected to put specific emphasis on how to contribute to the future EU initiative on ocean observation, to have a key role in the implementation of the European Ocean Observing System (EOOS), including research infrastructures, in the development of a common European ocean data space connected to the European Open Science Cloud (EOSC) and European Green Deal data spaces, and contribute to the development of Digital Twin Ocean. All quality-controlled data collected through actions funded from this co-fund call should follow FAIR principles and be made available through open access data systems supported by the European Commission (such as Copernicus, GEOSS, EMODnet).

The partnership's additional activities should put the emphasis on the development of basin- or Europe-wide holistic, integrated, systemic and cross-sectoral approaches and foster co-creation processes involving all relevant stakeholders and actors, while remaining operationally manageable and taking into account the recommendations from additional support offered by the European Commission in 2022. The additional activities are expected

to be implemented through the 'multi-actor approach' and ensure adequate involvement of researchers from different disciplines, advisors, local, regional and national authorities, government representatives, industry and businesses, including SMEs, knowledge institutions and citizens, civil society organisations including NGOs, and other relevant actors of the value chain, supported through Open Science and an inclusive governance, policy and decision-making. It should harness the full potential of social sciences and humanities (SSH), social innovation and citizen engagement to deliver portfolios of solutions, measures and tools and facilitate their replication, and upscaling. In particular, the effective contribution of SSH disciplines and expertise is expected to produce meaningful and significant effects enhancing the societal impact of the related research and innovation activities.

Additional activities should contribute to improve the health and quality of life and long-term socio-economic prospects of coastal communities, including women, youth and the most vulnerable groups like indigenous people, in the context of major transitions and rising threats to climate, resources and health, including by increasing their resilience to crises like the COVID-19 pandemic. In line with the European Commission's political vision of leaving no one behind, the wide diversity and heterogeneity in levels of socio-economic, technological, institutional, innovation and skills potential should be taken into account.

The partnership is expected to include partners from additional countries, including Associated Countries, in its consortium, as it should cover the Atlantic, the Baltic Sea, the North Sea, the Mediterranean and the Black Sea to the maximum extent possible. It is expected to include and be open to all relevant public marine/maritime funding organisations and ministries from EU Member States and Associated Countries as core members, in close cooperation with the private sector, including SMEs and foundations. Appropriate links to other relevant ministries and organisations, including civil society, should be established.

Given the global dimension of ocean policy, membership and other modalities of participation from organisations and institutions in Non-Associated Third Countries is expected, in particular key partners bordering the different EU sea basins. In line with the Europe's global approach to cooperation in research and innovation, international cooperation should contribute to align strategies and research agendas, strengthen data collection, monitoring and sharing, as well as access to research infrastructures, promote good practice for maritime policies, promote the exchange and export of key technologies and gradually open up cooperation with new countries outside of Europe.

Through the additional activities and new partners, the partnership should support the EU's strong commitment to the UN Decade of Ocean Science for Sustainable Development, the UN Decade of Ecosystem Restoration, the G7 Future of the Seas and Oceans Initiative, the All-Atlantic Ocean Research and Innovation Alliance, the BLUEMED Initiative, the Black Sea Synergy and other international initiatives.

Partners are expected to continue to provide contributions for the governance structure, the joint calls and other dedicated implementation actions and efforts for national coordination. The partnership is expected to mobilise EU, national and regional capacities to leverage

investments, including from the private sector, increase up-scalability and market accessibility for the developed solutions and thus increase the return to investments.

To ensure the coherence and complementarity of activities, and to leverage knowledge investment possibilities, the partnership is expected to foster close cooperation and ensure synergies with other relevant European Partnerships, in place and proposed, notably “Rescuing biodiversity to safeguard life on Earth”, “Sustainable food systems for people, planet and climate”, “Water security for the planet (Water4All)”, and related actions for coordinating and supporting the combined activities of Member States and Associated Countries towards the objectives of the “Zero-emission waterborne transport” (ZEWT) Partnership, “Clean Energy Transition”, “Artificial intelligence, Data and Robotics”, the European Open Science Cloud (EOSC) and others where relevant, as well as the EIT Climate KIC, the EIT FOOD and the “European Open Science Cloud (EOSC)”. The partnership will also be linked to the relevant objectives of the mission “Restore our Ocean and Waters by 2030”. Proposers are expected to describe in details the way to plan and implement such collaborations through dedicated tasks and appropriate resources.

Engaging with managing authorities of European Structural and Investment Funds, as well as others like LIFE, the Recovery and Resilience Facility, the Instrument for Pre-Accession Assistance (IPA III) and Neighbourhood, Development and International Cooperation Instrument (NDICI), during partnership implementation would help increase the implementation of the project outcomes and support and facilitate further uptake.

While the award of a grant to continue the Partnership in accordance with this call should be based on a proposal submitted by the coordinator of the consortium funded under HORIZON-CL6-2022-GOVERNANCE-01-02: European Partnership for a climate neutral, sustainable and productive Blue Economy and the additional activities (which may include additional partners) to be funded by the grant should be subject to an evaluation, this evaluation should take into account the existing context and the scope of the initial evaluation as relevant, and related obligations enshrined in the grant agreement.

Taking into account that the present action is a continuation of topic HORIZON-CL6-2022-GOVERNANCE-01-02 and foresees an amendment to an existing grant agreement, the proposal should also present in a separate document the additional activities and additional partners, if any, to be covered by the award in terms of how they would be reflected in the grant agreement. The proposal should also describe the specific activities foreseen in order to strengthen the synergies with other related Missions and Partnerships.

The Commission envisages to include new actions in future work programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2024-GOVERNANCE-01-2: Regional ecosystems of innovation to foster food system transformation

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.50 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵⁰⁷ .

Expected Outcome: In line with the objectives of the European Green Deal, the farm to fork strategy for a fair, healthy and environment-friendly food system, the food 2030 priorities and the EU’s climate ambition for 2030 and 2050, the successful proposal will contribute to the sustainability and resilience of EU food systems by supporting the establishment of innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation. Successful proposals will boost knowledge sharing, interactions and priority setting in the form of an acceleration agenda between all relevant food systems actors, in particular small and medium-sized enterprises (SMEs) and industrial clusters, start-ups, universities/research centres, public authorities and civil society organisations.

Project results are expected to contribute to all of the following expected outcomes:

- Coherent business-focused analysis of R&I bottlenecks and opportunities for the transition of European food systems in line with the farm to fork strategy objectives, in particular to contribute to the 25% organic food target.

⁵⁰⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Improved coordination of existing European and national platforms with regional innovation ecosystems actors at EU level.
- Strengthened European regions (NUTS 2 level) and their regional actors.
- Contribution to the farm to fork objectives and food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: Collaboration between innovation actors across Europe is necessary to accelerate and master the innovative solutions needed for the food system transformation and the implementation of sustainable solutions. Innovation ecosystems can be found in many locations in Europe, but too few places can be seen as regional ecosystems of innovation. Moreover, the strength and depth of interconnections, information flows and knowledge transfers inside innovation ecosystems and between actors vary widely.

Strong and well-connected food systems actors, in particular small and medium-sized enterprises (SMEs) and industrial clusters, start-ups, universities/research centres, public authorities and civil society organisations, have the potential to become ecosystems of innovation facilitating coordination and multi-stakeholder engagement, to create an effective framework for action to support the food system transition in the EU and Associated Countries. The framework is expected to allow pooling of resources, coordinating efforts, and facilitating and promoting the multi-actor approach. Relevant capacities to foster the necessary R&I in the short, medium, and long term will be developed, giving a specific focus to the objective to boost the organic food sector.

Proposed activities should cover all of the following aspects:

- Strengthen existing ecosystems of innovation to broaden their scope and take on a “food systems approach” that delivers on the Food 2030 co-benefits (nutrition, public health, climate, circularity and communities) by: (a) deploying a quadruple helix model (that fully engages the four major actors in the innovation system: small and medium-sized enterprises and industrial clusters, universities/research centres, public authorities, and civil society organisations); and (b) delivering solutions that empower regional actors and their regional innovation ecosystems through an acceleration agenda.
- Devise an acceleration agenda connected with existing research and innovation agendas that align to target mutual objectives and cross regional collaborations, in particular by identifying and creating links to regions with priorities relevant for sustainable food systems identified in their local smart specialisation strategies, as well as relevant smart specialisation partnerships and platforms (such as the Thematic Smart Specialisation Platform on Agri-food).
- Provide technical assistance, encourage “mutual learning” and stimulate “new” ecosystems of innovation in parts of Europe that are less well integrated, for example

with the objectives of the BIOEAST Food Systems Thematic Working Group (e.g., to catalyse future reflections and discussions at regional level regarding the need to work together to tackle food system transformations).

- Explore how the existing Responsible Research and Innovation (RRI) approach can help regional actors to implement farm to fork relevant objectives, in particular for societally relevant market solutions that contribute to public health objectives and environmental businesses such that they contribute to the “EU Code of Conduct on Responsible Food Business and Marketing Practice”.
- Take a systemic view to help industries built up around the European food systems related businesses, to innovate and cooperate, thereby proposing solutions of regional relevance.
- Identify and facilitate synergies with other financing and capacity building instruments to enable progress along the whole innovation pipeline, including the Interregional Innovation Investments (I3), a new funding instrument under the European Regional Development Fund (ERDF).

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of small and medium-sized enterprises (SMEs) and industrial clusters, start-ups, universities/research centres, public authorities and civil society organisations and other relevant actors of the value chain.

Proposals should include a dedicated task, appropriate resources and a plan on how they will collaborate with other projects funded under in the work programme from 2018-2020 and 2021-2022, namely CE-FNR-07-2020: “FOOD 2030 - Empowering cities as agents of food system transformation” and HORIZON-CL6-2021-GOVERNANCE-01-07 “Regional governance models in the bioeconomy”.

Collaboration and complementary with the European Partnership on “Sustainable Food Systems for People, Plant and Climate” is encouraged. This topic should involve the effective contribution of SSH disciplines, as it involves the quadruple helix to deliver innovative locally-based and bottom-up solutions, engaging citizens and leading to behavioural changes. In order to achieve the expected outcomes, international cooperation is encouraged.

HORIZON-CL6-2024-GOVERNANCE-01-3: The role of mainstream media, social media and marketing in fostering healthy and sustainable consumption patterns and how to encourage good practices

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵⁰⁸ .

Expected Outcome: In line with the objectives of the European Green Deal, Europe’s beating cancer plan, the farm to fork strategy for a fair, healthy and environment-friendly food system, the food 2030 priorities and the EU’s climate ambition for 2030 and 2050, the successful proposal will facilitate the transition towards healthy and sustainable dietary behaviour by supporting the establishment of innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation. The main objective of this topic is to better understand factors influencing dietary behaviour and to advance the understanding of the role of mainstream media, social media and digital marketing in fostering (un-)healthy and (un-)sustainable consumption patterns and to encourage good practices.

Projects results are expected to contribute to all of the following expected outcomes:

- Improved knowledge and understanding of how mainstream media, social media and marketing is affecting the dietary behaviour of different target groups (in particular vulnerable groups) across Europe, including barriers and constraints, as well as how to detect incorrect or misleading information.
- Better understanding of the different media and marketing (both linear and non-linear) approaches and channels used by different food system operators and actors.
- Enabling consumers to make informed food choices.

⁵⁰⁸ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

- Informed policies and business strategies aimed at fostering healthy and sustainable food environments, consumption patterns and at encouraging or incentivizing good practices.
- Contribution to the farm to fork objectives and food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Scope: Food consumption cannot be considered the sole responsibility of citizens or a problem of demand only since it is a result of a choice that is influenced by culture, social and economic factors and where the food environment plays an important role. In today's interconnected world, the impacts of mainstream media, social media and digital marketing are amplified, with food influencers, NGOs and social platforms making citizens think differently about food. As studies show, since eating habits are also influenced by what consumers see, being virtually surrounded by healthy eaters may encourage consumers to eat healthier. However, the reverse is also true.

In addition, differences in media and marketing (both linear and non-linear) approaches of national/regional/local governments, civil society, and the private sector, can lead to differences in consumption patterns and food choices across different socio-economic and cultural groups. Moreover, television viewing and internet use has led to a more inactive, sedentary lifestyle, as well as more exposure to the marketing of products high in fat, sugar and/or salt among adults and children. Greater levels of TV viewing and internet use is associated with harmful effects on the eating habits of children. This includes higher consumption levels of products high in fat, sugar and/or salt. An improved understanding of these differences and drivers of food choices can support all food systems operators and actors to develop innovative and effective communication strategies (and related policy and regulatory frameworks) that would benefit all parts of the society and support a shift towards healthy and sustainable diets for all.

Proposed activities should cover all of the following aspects:

- Identify the various techniques and vehicles for spreading information and influence behaviour using different mainstream and social media channels (such as apps, websites, virtual consumer clubs and platforms), in particular mapping of new communication tools, algorithms and machine learning principles where citizens make food choices or are consciously or unconsciously influenced to change the consumption behaviour.
- Compare the different media and marketing (both linear and non-linear) approaches of national/regional/local governments, civil society, and the private sector, and assess how these different types of approaches and channels affect consumption patterns and food choices across different socio-economic and cultural groups, with a particular emphasis on vulnerable groups such as persons with low socio/economic status, infants and children or their parents responsible for their diets, respectively.

- Explore the impact of negative news (e.g., information on food safety risks, information on impacts on biodiversity and ecosystems) as compared with messages promoting positive outcomes of food choices (e.g., information on nutritional and health benefits) by, for example, conducting surveys or employing sentiment analyses. Assess whether parental control can be considered an effective strategy given the real-world context and levels of independent exposure of children to linear and non-linear media. Also explore the effects of misinformation (intentional or not), and how this propagates through different media.
- Identify innovative and effective tools to improve communication on sustainable healthy nutrition and diets, and more generally on sustainable food systems, thereby ensuring that all parts of the society are benefitting from access to information that foster uptake of healthy and sustainable diets and lead to the transformation of food systems, while respecting the EU and national legal framework and policies, national educational policies and advice on nutrition and food.
- Compile strategies and best practices – in compliance with the Best Practice Portal Protocols – for all food systems operators and actors for communication and outreach efforts to foster healthy, sustainable, and alternative consumption patterns and to encourage good practices, while respecting the EU and national legal framework and policies, national educational policies and advice on nutrition and food.
- Clearly explain how results will deliver co-benefits on Europe’s Beating Cancer Plan, the farm to fork strategy and on each of the food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowering communities (e.g., meeting the needs, values and expectations of society in a responsible and ethical way).

Proposals must implement the 'multi-actor approach' and ensure adequate involvement of public authorities and civil society organisations, consumers, the private sector and other relevant actors of the value chain.

Where relevant, activities should build and expand on the recent studies carried out in this area (such as the study on the exposure of children to online marketing of foods high in fat, salt or sugar),⁵⁰⁹ on the results of past and ongoing EU joint actions (such as Best-ReMaP on diet and nutrition with a special focus on children) and EU research projects (such as the topics HORIZON-CL6-2021-FARM2FORK-01-15 and HORIZON-CL6-2023-COMMUNITIES), e.g. by participating in joint activities, workshops, as well as common communication and dissemination activities.

Proposals should bring together multiple types of scientific expertise in health and natural sciences, and social sciences and humanities (SSH). This topic should involve the effective

⁵⁰⁹ European Commission, Directorate-General for Health and Food Safety (2021) Study on the exposure of children to linear, non-linear and online marketing of foods high in fat, salt or sugar: Final report, Publications Office, <https://data.europa.eu/doi/10.2875/928620>.

contribution of SSH disciplines (e.g., economics, sociology, human geography, management science, political science, citizen engagement studies, cultural studies, gender studies, etc.).

Efforts should be made to ensure that the data and the output produced in the context of this topic is FAIR (Findable, Accessible, Interoperable and Re-usable).

Deploying and adding value to Environmental Observations

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-GOVERNANCE-01-5: Customisation/pre-operationalisation of prototypes end-user services in the area Climate Change Adaptation and Mitigation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 19.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 19.00 million.
<i>Type of Action</i>	Pre-commercial Procurement
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).</p> <p>The following additional eligibility criteria apply: Project(s) should have a maximum duration of 3 years.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>The specific conditions are described in General Annex H.</p> <p>PCP/PPI procurement costs are eligible.</p>

Expected Outcome: The successful proposal will be contributing to the European Green Deal related domains benefiting from further deployment, uptake and exploitation of Environmental Observation data and products. It will furthermore be contributing to fit-for-purpose Environmental Observation Systems and a strengthened Global Earth Observation System of Systems (GEOSS)⁵¹⁰.

Proposals are expected to contribute to all of the following outcomes:

⁵¹⁰ <https://www.earthobservations.org/geoss.php>.

- Customisation/pre-operationalisation of prototypes end-user services in the area Climate Change Adaptation and Mitigation, building on the Copernicus⁵¹¹ Services that respond to the common needs and beyond state-of-the-art performance targets of the buyers group;
- Reduction of fragmentation of demand for innovative solutions by enabling public procurers to collectively implement a Pre-Commercial Procurement (PCP) in the area of climate adaptation and mitigation, which, due to their nature, are better addressed jointly, or which they would not have been able to tackle independently;
- New opportunities for wide market uptake and economies of scale for the supply side through the use of joint specifications, wide publication of results and – where relevant – contribution to standardization, regulation or certification to remove barriers for introduction of innovations into the market and creation of new products, processes and/or services ready for market uptake, leading to viable new businesses, jobs and sustainable economic growth.

Scope: This PCP – i.e. a joint procurement of research and development services - is launched to reinforce public demand driven innovation in end-user services in the area of climate adaptation and mitigation. PCP has the potential to be an effective demand side innovation action and a useful tool to close the gap between supply and demand for innovative solutions.

The PCP should deliver successful innovative and fully tested product(s) and/or service(s) that meet the common needs of a buyers' group (consortium of procurers) to procure research, develop innovative marketable solutions, speed up the time-to-market and provide best value for money.

Activities shall include:

- Preparation of the relevant documentation needed to launch and implement the procurement procedure;
- Joint research activities relating to the customisation/pre-operationalisation of prototypes end-user services in the area of climate change adaptation and mitigation validating the PCP strategy;
- Activities for the follow-up of the joint procurement, such as activities for awareness raising, networking, training, evaluation, validation and dissemination of results.

The proposal is expected to build on the outcomes coming from:

- HORIZON-CL6-2021-GOVERNANCE-01-15: Preparing for pre-commercial procurement (PCP) for end-user services based on environmental observation in the area of climate change adaptation and mitigation. The work done previously under Horizon

⁵¹¹ <https://www.copernicus.eu/en>.

2020 and Horizon Europe (e.g., from e-shape, climate service projects and downstream services projects);

- GEOSS initiatives.

The core of the consortium should be a qualified 'buyers group' (public procurement consortium), able to implement the action. Additional partners such as business/SME support organisations, innovation agencies or sectoral organisations may be included to assist procurers in knowing what is available on the market through market consultations.

The proposal should describe the jointly identified challenge, indicating how it fits into the mid-to-long-term innovation plans of the consortium, why solutions currently available on the market or under development are not meeting their needs, and put forward concrete targets for the desired functionality/performance improvement in the quality and efficiency of their public services.

The proposal should explain clearly how the creation of jobs, sustainable economic growth and new businesses will be assessed as an integral part of the successful application.

HORIZON-CL6-2024-GOVERNANCE-01-6: Develop innovative applications to support the European Green Deal, building on meteorological satellite data

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 8.00 million.
<i>Type of Action</i>	Research and Innovation Actions

Expected Outcome: A successful proposal will be delivering new environmental information through the exploitation of Earth observations and promote application development and pre-operational European services through cloud infrastructures, supporting the GEO engagement priorities and the objectives of the European Green Deal.

They should be in line with the European strategy for data and Europe’s Digital Decade, thus developing new advanced products, adding value to safety and healthy critical applications of environmental observations and contributing to a strengthened Global Earth Observation System of Systems (GEOSS)⁵¹² and complementing or enhancing the Copernicus⁵¹³ services.

Proposals are expected to contribute to all of the following outcomes:

⁵¹² <https://www.earthobservations.org/geoss.php>.
⁵¹³ <https://www.copernicus.eu/en>.

- Uptake of the newly available environmental information and data at global and regional scale delivered through the Copernicus Sentinels and the EUMETSAT⁵¹⁴ “Meteosat Third Generation (MTG)” and “EUMETSAT Polar System Second Generation (EPS SG)”;
- Preparation and implementation of high-quality (novel) satellite data products and applications using the next generation EUMETSAT and Copernicus instruments for the exploitation by advanced physical/chemical/biochemical models, and integrating in-situ data, to improve the implementation and operationalisation of new and advanced services and applications;
- Demonstrated use of these applications for Earth Systems predictions, long-term climate monitoring (i.e., re-analysis within the Copernicus climate services context) and disaster risk prediction and reduction (e.g., within the framework of the Copernicus Emergency Management service);
- Exploitation of the European cloud systems (e.g. Copernicus DIAS⁵¹⁵, European Open Science Cloud⁵¹⁶, European Weather Cloud) and a contribution to the Destination Earth initiative⁵¹⁷;
- Demonstrated use of satellite derived environmental information to advance and improve seamless climate-weather and environmental services in Europe, and potentially beyond.

Scope: The successful applications should take up and enhance the development of new environmental information based on the Meteosat Third Generation (MTG) and EUMETSAT Polar System Second Generation (EPS SG)⁵¹⁸. They should explore pre-operational European services through the exploitation of new Earth Observation (EO), digital infrastructures and modelling capabilities.

In the coming years, the MTG and EPS SG satellites will provide an unprecedented view of the Earth System offering opportunities for developing weather, climate, air-quality and marine applications. Copernicus Sentinels 4 and 5 will be collocated within the MTG and EPS-SG payloads, offering an important opportunity to develop synergetic products.

Ongoing Copernicus and EUMETSAT missions will complement this observational framework. EUMETSAT will facilitate the access to these data to the successful applications under this topic.

Proposals should build on these and other missions (e.g., Sentinel), designing new methods and data products to exploit the synergies across instruments and platforms and showcase pilot services for public and private users. They should turn existing and future EO

⁵¹⁴ <https://www.eumetsat.int/>.

⁵¹⁵ <https://www.copernicus.eu/en/access-data/dias>.

⁵¹⁶ https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en

⁵¹⁷ <https://digital-strategy.ec.europa.eu/en/policies/destination-earth>.

⁵¹⁸ These satellites have a specific focus on greenhouse gases, air quality, ocean and land biodiversity, high-impact weather events and climate extremes.

measurements into new environmental information. Co-registration of measurements should allow for optimising the information extraction, as for example the life cycle of extreme weather events through lightning, hyperspectral and other instruments hosted by geostationary payloads.

Synergies should be considered for across-payloads (geostationary and polar orbiting systems) measurements, and through the use of advanced algorithms, machine learning/artificial intelligence, data assimilation techniques and atmospheric models and artificial intelligence/machine learning techniques. This should contribute to the design of new products exploiting the full spectrum of possibilities (as for example integrating chemistry and water cycle observations into new products/ knowledge). The tools and services developed under the successful applications should be made available for future integration in the Copernicus programme and in the common topical European open infrastructure, Destination Earth. Open-source data/information requires open access to data that is associated with important benefits for the society and economy when reused. They should furthermore ensure the collaboration with EuroGEO⁵¹⁹ and the relevant EuroGEO projects as well as ESA initiatives (such as EO4SD⁵²⁰).

Successful applications should also develop applications using the new environmental data/information within key domains (e.g., urban and coastal management, air quality and health, disaster risk reduction, sustainable blue economy and climate adaptation/mitigation), as enhancements of already available services.

Attention should be given the sustained uptake of data/services or these satellites by the European commercial sector.

Digital and data technologies as key enablers

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-GOVERNANCE-01-7: Enhancing working conditions and strengthening the work force through digital and data technologies – the potential of robotics and augmented reality in agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million.

⁵¹⁹ https://ec.europa.eu/info/research-and-innovation/knowledge-publications-tools-and-data/knowledge-centres-and-data-portals/eurogeo_en.

⁵²⁰ <https://eo4sd.esa.int/?msclkid=27bf6922c7a311ec9cd2c915ab1af722>.

<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 7-8 (according to the activity) by the end of the project – see General Annex B.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 60 000.

Expected Outcome: In line with the farm to fork strategy, the common agricultural policy post 2022, and the headline ambition of a Digital Age, a successful proposal will contribute to transition to a fair, healthy and resilient agriculture. It will therefore also directly and/ or indirectly contribute to the enhancement of the sustainability performance of the sector, including social sustainability, and competitiveness in agriculture through research and innovation which will support the further deployment of digital and data technologies as key enablers.

Project results are expected to contribute to all of the following expected outcomes:

- Enhanced working conditions in agriculture (including increased safety of workers and reduced drudgery) through innovative digital solutions exploiting the potential of augmented reality.
- Lowered environmental impacts and productions costs and increased product quality in and through the use of digital technologies, through robotics and augmented reality in particular⁵²¹.
- Reduced share of risky or unattractive actions/tasks to be performed by workers through automation-based solutions.
- Mitigated shortage of work force in agriculture in some sub-sectors through automation-based solutions.

⁵²¹ Innovative solutions developed to address this point may foster both, robotics and augmented reality, or only on robotics or augmented reality.

Scope: Digital and data technologies can facilitate the work in agriculture, enhance working conditions⁵²² and mitigate the challenge of a lack of work force, by which some branches and regions are affected. They have the potential of making farm-related jobs more attractive, including for younger generations, and to make them safer. Digital and data technologies can increase the effectiveness and efficiency of applications, including for instance through a higher level of precision, and thus increase the sustainability and competitiveness of the sector. Automation is increasingly used in agriculture; frequently, the cost-effectiveness of innovative digital and data technologies still presents a bottleneck to their use in the sector, particularly in fields where their application is not primarily relevant for increasing process efficiency and effectiveness. Technical solutions based on augmented reality approaches offer many opportunities to facilitate and enhance the use of digital technologies in agriculture, to enhance the performance of digital tools, and to provide remote assistance, which is important for remote businesses, particularly in rural areas.

Proposals should address the following:

- Development of augmented-reality based solutions to improve working conditions, safety and failure avoidance, and to further increase robotic performance.
- Development of robotic solutions to improve unhealthy working conditions, where applicable. Robotics tasks to be fostered might be directly related to agricultural production, such as harvesting, weeding, crop monitoring, animal husbandry or indirectly related, such as logistics/ farm management (TRL 7-8).
- Development of robotic solutions for tasks, for which there is a high interest/ need to support and/ or replace the human work force, not only because of an interest to improve productivity, but to ensure production in an environmentally and socially sustainable way (TRL 7-8).
- Strengthening AI capabilities for agro-robotics in the fields of applications fostered by the proposals including through the use of (scalable) platforms to further increase robotics performance (TRL 7-8).
- Development of business models for the use of the developed innovative technologies under consideration of various farm structures and inter-farm linkages as well as of various biogeographic and socio-economic framing conditions.
- Development of a tool for system analyses of the consequences for farmers and rural communities of enhancing working conditions through automation and augmented reality and of replacing human work force with robotic systems.

The development of such technologies should take into account relevant (forthcoming) EU legislation, in particular linked to the horizontal Act on AI, as well as the legislation related to

⁵²² The enhancement of working conditions is of cross-sectoral relevance. In agriculture, under the CAP post 2022 more attention will be dedicated to working conditions and social conditionality: CAP payments will be linked to the respect of certain EU labour standards and beneficiaries will be incentivised to improve working conditions on farms.

liability and machinery. Projects are encouraged - when reflecting on the effects of automation and augmented reality - to dedicate particular attention to youth/ younger generation, women and persons with disabilities as well as to the affordability of digital solutions. Projects are expected to develop training material allowing the targeted end users and multipliers to easily deploy and promote the new technologies.

Proposals must implement the ‘multi-actor approach’ including a range of actors to ensure that knowledge and needs from various stakeholder groups, including farmers, farm workers, farm advisors and scientists are taken into consideration. This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Projects are expected to take into consideration the results of other related Horizon 2020/ Europe projects as well as of other relevant EU-funded projects and initiatives.

Proposals may involve financial support to third parties, e.g. to academic researchers, hi-tech start-ups, SMEs, and other multidisciplinary actors, to for instance, develop, test or validate developed approaches, tools and applications or to provide other contributions to achieve the project objectives. Consortia need to define the selection process of organisations, for which financial support may be granted. A maximum of 20% of the EU funding can be allocated to this purpose.

A project duration of 60 months might be envisaged.

Strengthening agricultural knowledge and innovation systems (AKIS)

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-GOVERNANCE-01-8: Broaden EIP Operational Group outcomes across borders by means of thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 2.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.

<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵²³ .
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Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the farm to fork strategy objectives and targets, the successful proposals will focus on knowledge sharing in a language that is easy to understand and targeted to farmers and foresters. They will address the necessity of primary producers for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience. They will also speed up innovation and the uptake of results, and will be key to improving sustainability.

They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁵²⁴), thereby adding value to the knowledge and cost-effectiveness of innovative practices and techniques in and across primary production sectors, food and bioeconomy systems, and lead to more informed and engaged stakeholders and users of project results.

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not sufficiently captured and spread. The research findings are often not integrated into agricultural and forestry practice. The proposals, acting at EU level to remedy this, are essential because national and sectoral agricultural knowledge and innovation systems (AKISs) are insufficiently connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. This exchange of knowledge will foster economically viable and sustainable agriculture and forestry and build trust between the main AKIS actors. It will scale local solutions up to the EU level and may even influence policy design wherever useful.

Project results are expected to contribute to all of the following outcomes:

- Contribution to the cross-cutting objective of the CAP on modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural

⁵²³ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁵²⁴ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

areas, and encouraging their uptake⁵²⁵, as well as to the European Green Deal and farm to fork strategy objectives and targets, including climate change and carbon farming.

- Collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, in particular the existing innovative solutions, best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners.
- Maintenance of practical knowledge in the long-term – beyond the project period – in particular by using the main trusted dissemination channels which farmers/foresters most often consult.
- Increased flow of practical information between farmers/foresters in the EU in a geographically balanced way, creating spill-overs and taking account of the differences between territories.
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge, by connecting actors, policies, projects and instruments to speed up innovation and promote the faster and wider co-creation and transposition of innovative solutions into practice.

Scope: Proposals should address the following activities:

- Build on the experiences and outcomes of at least 5 EIP-AGRI Operational Groups of at least 3 Member States and choose a common theme related to the themes of the 5 Operational Group projects.
- Tackle the most urgent needs of farmers and foresters. Collect, summarise, share and translate the existing knowledge from science and practice, resulting from the EIP operational Groups and beyond, in an easy-to-understand language for practitioners.
- Compile a comprehensive description of the state of current farming practices on the chosen theme to explain the added value of the proposal and the relevance of the theme. Proposals should focus on the cost/benefit aspects of the practices collected and summarised, and clarify how the project avoids duplication with ongoing or completed projects and networks.
- Deliver an extensive range of useful, applicable and appealing end-user material for farmers and foresters. This info should be easy to access and understand, and feed into the existing dissemination channels most consulted by farmers and foresters in the countries.
- Deliver as much audio-visual material and as many “practice abstracts” in the common EIP-AGRI format as possible, also including education and training materials.

⁵²⁵ Art 5 CAP post 2020 proposal.

- All materials should also be provided to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability' in the common 'practice abstract' format, as well as to national/regional/local AKIS channels and to the EU wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.
- In addition to giving the details on the EIP Operational Groups whose involvement is strongly recommended⁵²⁶, wherever possible and relevant to the chosen theme, provide also details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI.
- Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly activating farmers/foresters, farmers' groups and advisors and run for a minimum of 3 years.
- In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2024-GOVERNANCE-01-9: Thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for

⁵²⁶ According to the requirements of the multi-actor approach.

	Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵²⁷ .
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Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the farm to fork strategy objectives and targets, the successful proposals will focus on knowledge sharing in a language that is easy to understand and targeted to farmers and foresters. They will address the necessity of primary producers for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience.

They will also speed up innovation and the uptake of results, and will be key to improving sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁵²⁸), thereby adding value to the knowledge and cost-effectiveness of innovative practices and techniques in and across primary production sectors, food and bioeconomy systems, and lead to more informed and engaged stakeholders and users of project results.

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not sufficiently captured and spread. The research findings are often not integrated into agricultural and forestry practice. Proposals, acting at EU level to remedy this situation, are essential because national and sectoral AKISs are insufficiently connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. This exchange of knowledge will foster economically viable and sustainable agriculture and forestry and build trust between the main AKIS actors.

Project results are expected to contribute to all of the following outcomes:

- Contribution to the cross-cutting objective of modernising the sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁵²⁹, as well as to the European Green Deal, including climate change, and farm to fork strategy objectives and targets.
- Collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, in particular the existing innovative solutions, best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners.

⁵²⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁵²⁸ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

⁵²⁹ Art 5 of the post 2020 CAP regulation.

- Maintenance of practical knowledge in the long-term – beyond the project period – in particular by using the main trusted dissemination channels that farmers/foresters most often consult.
- Increased flow of practical information between farmers/foresters in the EU in a geographically balanced way, creating spill-overs and taking account of the differences between territories.
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge, by connecting actors, policies, projects and instruments to speed up innovation and promote the faster and wider co-creation and transposition of innovative solutions into practice.

Scope: Proposals should address the following activities:

- Tackle the most urgent farmers' or foresters' needs by summarising, sharing and presenting – in a language that is easy to understand and is targeted to farmers and foresters – the existing best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners. The specific themes of the networks can be chosen in a 'bottom-up' way on the condition that they contribute to the relevant EU policy objectives, including climate change mitigation or adaptation;
- Compile a comprehensive description of the state of current farming/forestry practices on the chosen theme to explain the added-value of the proposal and the relevance of the theme. Proposals should focus on the cost/benefit aspects of the practices collected and summarised, and clarify how the project avoids duplication with ongoing or completed projects and networks;
- Deliver an extensive range of useful, applicable and appealing end-user material for farmers and foresters. This info should be easy to access and understand, making use of audio-visual material wherever possible, including also materials serving education and training and automatic translation services that allow dissemination beyond language barriers;
- This range of material should feed into the existing dissemination channels most consulted by farmers and foresters in the countries;
- As many “practice abstracts” in the common EIP-AGRI format as possible, as well as other types of materials should be provided to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability', as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24);
- Besides giving the details on the EIP Operational Groups whose involvement is strongly recommended⁵³⁰, wherever possible and relevant to the chosen theme, provide also

⁵³⁰ According to the requirements of the multi-actor approach.

details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI;

- Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly activating farmers/foresters, farmers' groups and advisors; and run for a minimum of 3 years;
- In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2024-GOVERNANCE-01-10: Organic farming thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵³¹ .

Expected Outcome: Successful proposals will support the objectives of the European Green Deal, including on climate change, of the common agricultural policy (CAP) and of the farm

⁵³¹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

to fork strategy, notably its target to reach at least 25% of the EU's agricultural land under organic farming by 2030. This topic addresses the necessity of organic farming producers for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience. Successful proposals will speed up innovation and the uptake of results, and will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁵³²).

Project results are expected to contribute to all of the following outcomes:

- Support for the implementation of the CAP's cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁵³³, as well as the objectives of the Action Plan for the Development of Organic Production⁵³⁴ related to the promotion of best practices and synergies with EIP-AGRI projects, enhancing knowledge exchange and strengthening AKIS;
- Collection, distribution and dissemination to farmers of easily accessible practice-oriented knowledge focusing on organic farming, in particular the existing best practices and research findings that are ready to be put into practice;
- Increased flow of practical information between farmers in the EU and Associated Countries in a geographically balanced way;
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge.

Scope: Transformative changes, such as the ones called for by the farm to fork strategy and the European Green Deal, are dynamic and complex processes. This is particularly the case of organic farming, a more knowledge-intensive approach compared to more conventional ones. This topic aims at supporting the achievement of the farm to fork strategy target of at least 25% of the EU's agricultural land under organic farming by 2030, for which knowledge and best practice exchange among farmers and across the EU and Associated Countries are fundamental, as it is recognised in the action plan for the development of organic production⁵³⁵. In this respect, it also aims to support climate change mitigation and adaptation, including carbon farming uptake. Despite the continued funding of scientific projects devoted specifically to address the challenges of organic farming, research findings are not sufficiently integrated into agricultural practice. Therefore, new knowledge and innovative ideas are not sufficiently shared with and adopted by organic farmers. Moreover, national and sectoral AKISs are insufficiently connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. The exchange of knowledge can foster economically viable and sustainable agriculture.

⁵³² AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

⁵³³ Art 5 of the post 2020 CAP regulation.

⁵³⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>.

⁵³⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>.

Proposals should focus on knowledge sharing that addresses the most urgent needs of organic farmers, involved in plant production and/or animal husbandry, for impartial and tailored knowledge on the management choices related to the needs, challenges or opportunities they experience in their specific contexts. The specific subthemes of the network should be chosen in a 'bottom-up' way. Proposals should focus on the cost/benefit aspects of the practices identified. End-user material for farmers should include conversion and business plans. The differences between countries/regions/territories should be duly taken into consideration.

In this context, proposals should:

- Describe comprehensively the state of available knowledge of organic farming practices on the chosen theme and justify the added-value and the relevance of the theme, and explaining how duplication with ongoing or completed projects and networks is avoided.
- Summarise, share and present – in a language that is easy to understand and is targeted to farmers – the existing best practices and research findings that are ready to be put into practice.
- Deliver an extensive range of useful, applicable and appealing material for organic farmers. This material should be easy to access and understand, making use of audio-visual material wherever possible, including also materials serving education and training. The material should feed into existing dissemination channels most consulted by farmers in the different countries.
- Provide “practice abstracts” in the common EIP-AGRI format, as well as other type of materials, to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability', as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24).
- In addition to giving the details on the EIP Operational Groups which are strongly recommended to be involved⁵³⁶, wherever possible and relevant to organic farming, provide also details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI.
- Ensure the long-term - beyond the project period - availability of the practical knowledge collected.

Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly building on organic farmers, farmers' groups and advisors, and should run for a minimum of 3 years. Proposals may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system, in order to better reach and capture knowledge from the targeted farmers and to address context-specific challenges. Outcomes should be widely spread beyond the organic farming community and reach also farmers involved in carbon farming, low-input farming, circular agriculture or agroecology.

⁵³⁶ According to the requirements of the multi-actor approach.

Proposals should include a dedicated task, appropriate resources and a plan on how they will ensure synergies with the activities carried out by projects selected under the topic HORIZON-CL6-2023-GOVERNANCE-01-20: ‘Developing an EU advisory network on organic agriculture’, HORIZON-CL6-2024-FARM2FORK-02-1-two-stage: ‘Increasing the availability and use of non-contentious inputs in organic farming’, and HORIZON-CL6-2023-FARM2FORK-01-3: ‘Improving yields in organic cropping systems’ in this Work Programme.

HORIZON-CL6-2024-GOVERNANCE-01-11: Biodiversity thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 3.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 3.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵³⁷ .

Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the farm to fork strategy objectives and targets, the successful proposals will focus on knowledge sharing in a language that is easy to understand and targeted to farmers and foresters. They will address the necessity of primary producers for impartial and tailored knowledge on the management choices related to the needs, challenges

⁵³⁷ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under ‘Simplified costs decisions’ or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

or opportunities they experience. They will also speed up innovation and the uptake of results, and will be key to improving sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁵³⁸), thereby adding value to the knowledge and cost-effectiveness of innovative practices and techniques in and across primary production sectors, food and bioeconomy systems, and lead to more informed and engaged stakeholders and users of project results.

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not shared and adopted. Often the research findings are not integrated into agricultural and forestry practice. Proposals, acting at EU level to remedy this situation, are essential because national and sectoral AKISs are insufficiently connected and organised to fully meet the challenge of intensifying thematic cooperation between researchers, advisors and farmers/foresters. This exchange of knowledge will foster economically viable and sustainable agriculture and forestry and build trust between the main AKIS actors.

Project results are expected to contribute to the following outcomes:

- Support the implementation of the cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁵³⁹, as well as European Green Deal and farm to fork objectives.
- Collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, in particular the existing best practices and research findings that are ready to be put into practice.
- Maintenance of the practical knowledge for the long-term – beyond the project period – in particular by using the main trusted dissemination channels that farmers/foresters most often consult.
- Increased flow of practical information between farmers/foresters in the EU in a geographically balanced way, creating spill-overs and taking account of the differences between territories.
- Greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge, by connecting actors, policies, projects and instruments to speed up innovation and promote the faster and wider co-creation and transposition of innovative solutions into practice.

Scope: Proposals should address the following activities:

⁵³⁸ AKIS means the organisation and knowledge flows between persons, organisations and institutions who use and produce knowledge for agriculture and interrelated fields (Agricultural Knowledge and Innovation).

⁵³⁹ Art 5 of the post 2020 CAP regulation.

- Tackle the most urgent needs of farmers and/or foresters related to biodiversity, including those relevant for climate change mitigation and adaptation, by summarising, sharing and presenting - in a language that is easy to understand and is targeted to farmers and foresters – the existing best practices and research findings that are ready to be put into practice, but not sufficiently known or used by practitioners. The specific objectives of the networks can be chosen in a 'bottom-up' way on condition that they tackle biodiversity issues.
- The network should cover at least the following aspects:
 - Incentives from farmers and foresters to improve biodiversity on farms/forests or across farms/forests in a collaborative way
 - EU requirements for biodiversity protection in agricultural and forest areas (Birds and Habitats Directives).
- Compile a comprehensive description of the state of current farming practices on biodiversity, including those relevant for climate mitigation or adaptation, to explain the added value of the proposal and the relevance of the theme.
- Proposals should focus on the cost/benefit aspects of the practices collected and summarised, and clarify how the project avoids duplication with ongoing or completed projects and networks.
- Deliver an extensive range of useful, applicable and appealing end-user material for farmers and foresters. This info should be easy to access and understand, making use of audio-visual material wherever possible, including also materials serving education and training;
- This range of material should feed into the existing dissemination channels most consulted by farmers and foresters in their countries.
- As many “practice abstracts” in the common EIP-AGRI format as possible, as well as other type of materials should be provided to the European Innovation Partnership (EIP-AGRI) 'Agricultural Productivity and Sustainability', as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24);
- Besides giving the details on the EIP Operational Groups whose involvement is strongly recommended⁵⁴⁰, wherever possible and relevant to biodiversity, provide also details on how further synergies will be built with future EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI.

⁵⁴⁰ According to the requirements of the multi-actor approach.

- Proposals must implement the 'multi-actor approach', with a consortium based on a balanced mix of actors with complementary knowledge clearly building on farmers/foresters, farmers' groups and advisors; and run for a minimum of 3 years.
- In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2024-GOVERNANCE-01-12: Developing EU advisory networks on forestry

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. The following exceptions apply:</p> <p>Legal entities established in non-associated third countries, including low to middle income non-associated third countries, may participate as a beneficiary in this Coordination and support action if their participation is considered essential for implementing the action by the granting authority.</p> <p>The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.</p>
<i>Legal and financial set-up of the Grant Agreements</i>	<p>The rules are described in General Annex G. The following exceptions apply:</p> <p>Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the Research and Training Programme of the European Atomic Energy Community (2021-2025).⁵⁴¹.</p>

⁵⁴¹ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

Expected Outcome: In support of the European Green Deal, the EU climate policy, the common agricultural policy (CAP) and the EU forest strategy for 2030 objectives, the successful proposal will focus on advisor exchanges across the EU to increase the speed of knowledge creation and sharing, capacity building, of demonstration of innovative solutions, as well as helping to bring them into practice, accelerating the necessary transitions. Agricultural Knowledge and Innovation Systems (AKIS) in which advisors are fully integrated are key drivers to speed up innovation and the uptake of research results by farmers.

Transformative changes such as the changes required within the European Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors with a role in providing strong guidance and with a big influence over producers' decisions. A novelty in the post-2020 CAP plans⁵⁴² is that advisors now must be integrated within the Member States' AKIS, and that the scope of their actions has become much broader. They must now be able to cover economic, environmental and social domains, as well as be up-to-date on science and technology. They should be able to translate this knowledge into opportunities, and use and adapt this knowledge to specific local circumstances. This specific topic focuses on the important role advisors can play related to more sustainable forestry in the future.

Project results are expected to contribute to the following outcomes:

- Progress towards the most urgent policy objectives linked to Cluster 6, as well as the European Green Deal, and in particular the EU Forest Strategy for 2030 and the new CAP, with a view to improve sustainability of forestry, help raise awareness and tackle societal challenges;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation, and encouraging their uptake⁵⁴³;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to practical forestry issues, such as bottlenecks, lock-ins, political inertia, ambiguous regulations, inequality between Member States and power imbalances;
- Production of supporting services and materials, including knowledge networks and peer-to-peer counselling, master classes, advice modules, communication and education materials, effective business models, etc. to facilitate the upscaling of sustainable forest management;
- Acceleration of the introduction, spread and implementation in practice of innovative solutions related to forestry, in particular by:

⁵⁴² Art 13(2) of the post 2020 CAP regulation.

⁵⁴³ Art 5 CAP post 2020 proposal.

- creating added value by better linking research, education, advisors and foresters, and encouraging the wider use of available knowledge across the EU;
- learning from innovation actors and projects, resulting in faster sharing and implementation of ready-to-use innovative solutions, spreading them to practitioners and communicating to the scientific community the bottom-up research needs of practice.

Scope: Proposals should address the following activities:

- Connect advisors possessing a broad and extensive network of foresters across all EU Member States in an EU advisory network dedicated to forestry, including forestry techniques which support a higher level of sustainability, with a view to sharing experiences on how to best tackle the issues, building on the outcomes of the EIP-AGRI Focus Groups and Workshops as well as the Horizon 2020 Thematic Networks related to forestry.
- Share effective and novel approaches among the EU advisory network on forestry, which are sustainable in terms of economic, environmental and social aspects.
- Gather or develop short-, mid- and long-term strategic visions for forests and forestry in the EU, taking into account regional differences, regional policy frameworks, climate change, supply and demand, monitoring needs, etc.
- Fill gaps on emerging advisory topics beyond the classical sectoral advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS and who must cover a much broader scope than in the past.
- Provide overall support related to knowledge creation, organisation and sharing.
- Take strong account of cost-benefit elements. Collect and document good examples in this regard, connecting with foresters and other actors across related value chains in Member States to be able to take into account financial aspects and local conditions. Select the best practices, learn about the key success factors, possible quick wins and make them available for (local) exploitation, to ensure financial win-wins for producers, citizens and intermediate actors.
- Integrate the advisors of the EU forestry network into their Member State AKIS as much as possible. They should encourage as innovation brokers innovative projects on forestry in EIP Operational Groups. They should give hands-on training to foresters and local advisors, lead national thematic and learning networks on the subject, deliver and implement action plans to make forestry more sustainable, connect with education and ensure broad communication, support peer-to-peer consulting, develop on-farm demonstrations and demo films distributed widely via social media, and provide specific back-office support for generalist advisors within the national/regional AKIS.
- Explore if the activities of the EU advisory network on forestry can be scaled up at the level of a number of Member States under a cooperative format. Wherever possible,

develop digital advisory tools for common use across the EU. Determine whether common tools can be created to incentivise the implementation of the learnings from this project.

- Include all 27 EU Member States in the EU advisory network, using local AKIS connections which can more accurately interpret the national/regional contexts to help develop the best solutions for that Member State or region. Use the support of the Member States' knowledge and innovation experts of the SCAR-AKIS Strategic Working Group to discuss project strategy and progress in the various stages of the 2 projects.
- Projects should run at least 5 years. They must implement the multi-actor approach, with a majority of partners being forestry advisors with frequent field experience.
- Provide all outcomes and materials to the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI), including in the common 'practice abstract' format for EU wide dissemination, as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.

HORIZON-CL6-2024-GOVERNANCE-01-13: Developing EU advisory networks on sustainable livestock systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 4.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 4.00 million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: The following additional eligibility criteria apply: The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this Work Programme part.
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G. The following exceptions apply: Eligible costs will take the form of a lump sum as defined in the Decision of 7 July 2021 authorising the use of lump sum contributions under the Horizon Europe Programme – the Framework Programme for Research and Innovation (2021-2027) – and in actions under the

	Research and Training Programme of the European Atomic Energy Community (2021-2025). ⁵⁴⁴ .
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Expected Outcome: In support of the European Green Deal, organic action plan, the common agricultural policy (CAP), farm to fork and biodiversity strategies, and the sustainable carbon cycles communication's objectives and targets, the successful proposal will focus on advisor exchanges across the EU in order to increase the speed of knowledge creation and sharing, capacity building, demonstration of innovative solutions, as well as helping to bring them into practice, which accelerates the necessary transitions. Agricultural Knowledge and Innovation Systems (AKIS), in which advisors play a central role, are key drivers to speed up innovation and the uptake of research results by farmers.

Transformative changes such as the changes required within the European Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors with a role in providing strong guidance and with a big influence on producers' decisions. A novelty in the post-2020 CAP plans⁵⁴⁵ is that advisors must now be integrated within the Member States' AKIS, and that the scope of their actions has become much broader. They must be able to cover economic, environmental and social domains, as well as be up-to-date on science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt this knowledge to specific local circumstances. This specific topic focuses on the important role that advisors can play in relation to boosting sustainable livestock systems in the future.

Project results are expected to contribute to the following outcomes:

- Progress towards the most urgent policy objectives linked to Cluster 6, as well as the European Green Deal, and in particular the new CAP, with a view to improving the sustainability of livestock management, helping to raise awareness and tackle societal challenges related to sustainable livestock systems, including climate change mitigation and adaptation;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁵⁴⁶;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to practical sustainable livestock production systems issues, such as bottlenecks, lock-ins, political inertia, ambiguous regulations, inequality between Member States and power imbalances;

⁵⁴⁴ This [decision](https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf) is available on the Funding and Tenders Portal, in the reference documents section for Horizon Europe, under 'Simplified costs decisions' or through this link: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ls-decision_he_en.pdf

⁵⁴⁵ Art 13(2) of the post 2020 CAP regulation.

⁵⁴⁶ Art 5 CAP post 2020 proposal.

- Production of supporting services and materials, including knowledge networks and peer-to-peer counselling, master classes, advice modules, communication and education materials, effective business models, etc. to facilitate the upscaling of sustainable livestock systems;
- Acceleration of the introduction, spread and implementation in practice of innovative solutions related to sustainable livestock systems, in particular by:
- creating added value by better linking research, education, advisors and farming practice, and encouraging the wider use of available knowledge across the EU;
- learning from innovation actors and projects, resulting in faster sharing and implementation of ready-to-use innovative solutions, spreading them to practitioners and communicating to the scientific community the bottom-up research needs of practice.

Scope: Proposals should address the following activities:

- Connect advisors possessing a broad and extensive network of farmers across all EU Member States in an EU advisory network dedicated to sustainable livestock systems, including farming techniques which support sustainable animal production, with a view to sharing experiences on how to best tackle the issues, building on the outcomes of the EIP-AGRI Focus Groups and Workshops as well as the Horizon 2020 Thematic Networks related to sustainable livestock systems.
- Share effective and novel approaches among the EU advisory network on livestock systems, which are climate-friendly and sustainable in terms of economic, environmental and social aspects.
- Fill gaps on emerging advisory topics beyond the classical sectoral advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS and who must cover a much broader scope than in the past.
- Provide overall support related to knowledge creation, organisation and sharing.
- Take strong account of cost-benefit elements. Collect and document good examples in this regard, connecting with farmers, intermediates and consumers in Member States to be able to take into account financial aspects and local conditions. Select the best practices, learn about the key success factors, possible quick wins and make them available for (local) exploitation, to ensure financial win-wins for producers, citizens and intermediate actors.
- Integrate the advisors of the EU sustainable livestock systems network into their MS AKIS as much as possible. As innovation brokers they should encourage innovative projects on organic farming in EIP Operational Groups. They should give hands-on training to farmers and local advisors, lead national thematic and learning networks on the subject, deliver and implement action plans to make livestock systems more sustainable, climate-friendly, and inspire new and incoming farmers or farms at the

cross-roads of intergenerational renewal, connect with education and ensure broad communication, support peer-to-peer consulting, develop on-farm demonstrations and demo films distributed widely via social media, and provide specific back-office support for generalist advisors within the national/regional AKIS.

- Explore if the activities of the EU advisory network on sustainable livestock systems can be up scaled at the level of a number of Member States under a cooperative format. Wherever possible, develop digital advisory tools for common use across the EU. Determine whether common tools can be created to incentivise the implementation of the learnings from this project.
- Include all 27 EU Member States in the EU advisory network, using local AKIS connections which can more accurately interpret the national/regional contexts to help develop the best solutions for that Member State or region. Use the support of the Member States' knowledge and innovation experts of the SCAR-AKIS Strategic Working Group to discuss project strategy and progress in the various stages of the 2 projects.
- Projects should run at least 5 years. They must implement the multi-actor approach, with a majority of partners being advisors with frequent field experience.
- Provide all outcomes and materials to the European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI), including in the common 'practice abstract' format for EU wide dissemination, as well as to national/regional/local AKIS channels and to the EU-wide interactive knowledge reservoir (HORIZON-CL6-2021-GOVERNANCE-01-24) in the requested formats.

Other actions not subject to calls for proposals

1. Support International Resource Panel (IRP) Secretariat

Expected impacts:

In line with the European Green Deal priorities, the proposal should set out a credible pathway to contributing to all of the following impacts:

- achieving sustainable and circular management and use of natural resources;
- lowering the use of primary non-renewable raw materials and reducing greenhouse gases emissions and other pollutants, achieving an improved environmental footprint (including on biodiversity), enabling climate-neutrality, zero pollution and higher resource efficiency;
- helping to achieve EU policy targets, such as the circular economy action plan, the EU biodiversity strategy for 2030, and the climate adaptation strategy.

Expected outcomes:

Project results are expected to contribute to all of the following expected outcomes:

- improved knowledge of information on the sustainable use and management of resources to shift away from overconsumption, waste and ecological harm;
- improved science-policy dialogue and dissemination of robust and policy-relevant outcomes, contributing to the EU and multilateral policymaking in the field of natural resource management, circular economy and sustainable consumption and production;
- strengthened synergies between the deliverables of EU research and innovation (R&I) framework programmes and the International Resource Panel (IRP).

Scope:

The International Resource Panel (IRP)⁵⁴⁷ is a science-policy interface which aims to build up and share the knowledge needed to improve the use of resources worldwide. The IRP was launched by the European Commission (COM(2005) 670) and set up in cooperation with the United Nations Environment Programme (UNEP). The Commission co-chairs the IRP's Steering Committee, which guides the Panel's strategic direction, ensures policy relevance, helps set the work programme, oversees budgets and provides advice on the Panel's scientific composition. The IRP's findings have been used by the Commission when shaping the European Green Deal and have informed resolutions adopted by the United Nations Environment Assembly⁵⁴⁸. The IRP work is often quoted or is at the basis of G7/G20

⁵⁴⁷ <https://www.resourcepanel.org/>

⁵⁴⁸ <https://www.unep.org/environmentassembly/>

documents and communiqués related to sustainable consumption and production, resource efficiency and the circular economy.

The EU will contribute financially to the IRP to help it implement its 2022-2025 and subsequent work programmes inter alia supporting the preparation and dissemination of IRP reports; facilitating the participation of scientists from the EU, Associated and Third Countries in this process; communicating about IRP deliverables and findings, also using the EU institutions platforms and channels of communication; and to strengthen the synergies between Horizon programmes' outcomes and IRP deliverables. EU financial support to the IRP aims also at providing evidence to policy makers and other relevant stakeholders for timely, high-quality and policy-relevant information and strengthen the science-policy dialogue on sustainable use of resources.

The proposal should inter alia illustrate how the 2022-2025 and subsequent IRP work programme will use new dissemination channels – how it will reach a wider range of target users, etc. It should also describe how relevant results from Horizon Europe and previous EU R&I framework programmes will be used in delivering on the 2022-2025 and subsequent work programmes and, where appropriate, create synergies with ongoing initiatives (collaboration with Horizon experts, use of common events, etc.).

Legal entities:

United Nations Environment Programme (International Resource Panel), UNEP, United Nations Avenue, Gigiri, Nairobi 00100, Kenya

Form of Funding: Indirectly managed actions

Type of Action: Indirectly managed action

Indicative timetable: First quarter of 2023

Indicative budget: EUR 3.75 million from the 2023 budget

2. Coordination and support service for Circular Cities and Regions Initiative (CCRI)

The circular economy concept should be a central component in local and regional economies, which have a suitable scale for closing resources loops, creating sustainable circular ecosystems and designing participatory community-based innovation schemes. An increasing number of cities, regions, industries and businesses are engaging in testing and improving circularity in their territories, economic sectors, value chains and services.

Nevertheless, concrete implementation of systemic solutions for the territorial deployment of the circular economy still needs to be demonstrated and replicated in other areas. In particular, a major challenge is to apply the circular economy concept effectively in urban and regional policy areas beyond traditional resource recovery in waste and water sectors.

The Circular Cities and Regions Initiative (CCRI)⁵⁴⁹ is part of the European circular economy action plan and aims to support circular solutions for the transition towards a sustainable, regenerative, inclusive and just circular economy on a local and regional scale. The aim of the CCRI's activities is to help implement the European Green Deal⁵⁵⁰, the circular economy action plan⁵⁵¹ and the bioeconomy strategy⁵⁵². The CCRI Coordination and Support Office is currently run via a 4-year framework contract (FWC) (from October 2021 until October 2025).

The objective of this new action is to continue and strengthen the coordination and support service for the CCRI's implementation at local and regional level beyond October 2025. It will also ensure the cooperation among the CCRI's projects covered under the Horizon 2020 European Green Deal Call and Horizon Europe and relevant initiatives and stakeholders.

Therefore, this action aims to launch a new 4-year Framework contract (FWC) with an estimated budget ceiling of EUR 6.00 million. No budgetary appropriations will be needed in 2024 as the signature of the FWC is expected in October 2025. The indicative budgets needed for specific contracts to be signed in 2025 and 2026 will be covered in the relevant work programme for those years.

Form of Funding: Procurement

Type of Action: Public procurement

Indicative timetable: Fourth quarter of 2024

3. GEO subscription 2023-2024

The EU will make an annual contribution to activities of the GEO (Group of Earth Observations) Secretariat for 2023-2024, in accordance with Article 239 of the Financial Regulation applicable to the general budget of the European Communities (2018) on making contributions to bodies of which the EU is a member or an observer.

As a full member of the GEO, the Commission will pay a contribution on the EU's behalf to the GEO Trust Fund, which is the budgetary structure agreed by GEO members to fund the GEO Secretariat (hosted by the World Meteorological Organisation in Geneva, Switzerland). This contribution will help ensure the Global Earth Observation System of Systems (GEOSS) is implemented according to its annual work plan and the continuity of the leadership and participation of the EU in the GEO.

Type of Action: Subscription action

Indicative timetable: Second quarter of 2023 and second quarter of 2024

⁵⁴⁹ https://ec.europa.eu/info/research-and-innovation/research-area/environment/circular-economy/circular-cities-and-regions-initiative_en.

⁵⁵⁰ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

⁵⁵¹ https://ec.europa.eu/environment/pdf/circular-economy/new_circular_economy_action_plan.pdf.

⁵⁵² https://ec.europa.eu/info/research-and-innovation_en.

Indicative budget: EUR 1.20 million from the 2023 budget and EUR 1.20 million from the 2024 budget

4. Scientific and technical services by the Joint Research Centre: Leveraging European data-sharing and exploitation practices within GEOSS (Global Earth Observation System of Systems) 2024

The next generation EuroGEOSS initiative will leverage a healthy community of users and providers, combined with an operational legal framework for data through the European data act, data governance act and implementing act for high-value datasets. The initiative will be effectively implementing prominent policy use cases through a technical approach that is fully in line with European values and the legal framework, and makes use of competitive advantages (such as open source technology, open standards, federated data infrastructure).

Using these outcomes as a starting point, in addition to the update of the technological approaches for accommodating ICT developments, in the next work programme (2024 – 2026) specific attention will be put on:

1. scaling the technical approaches to fully embrace private, IoT and personal data;
2. implementing and further developing additional use cases in line with the Commission's priorities and the regional development agenda;
3. expanding the approaches and technological developments of EuroGEOSS to other regions, specifically in Africa and other countries involved in the European Neighbourhood Instrument, within the context of the Global Gateway initiative.

Indicative duration: 36 months.

Form of Funding: Direct action grants

Type of Action: Provision of technical/scientific services by the Joint Research Centre

Indicative timetable: Fourth quarter of 2024

Indicative budget: EUR 2.60 million from the 2024 budget

5. Service Level Agreement with EEA “Enhancing the access to in situ Earth observation data in support of climate change adaptation policies and activities” 2024

A contribution over three years (2024-2027) to the European Environment Agency (EEA) will help accelerate the implementation of the GEO data sharing and management of relevant in situ Earth observation data in support of environmental and climate sustainability goals.

The contribution will be primarily focused on supporting the accessibility and the integration of in situ data (including from citizen science and Horizon Europe projects) as well as socio-economic data relevant for implementing the “Mission on adaptation to climate change”, the

EU adaptation strategy and the planned Digital Twin on Climate Adaptation⁵⁵³. It will also explore the availability and exploitation of in situ data for enhancing the links between climate change and air pollution, such as, in the context of ozone pollution, peak episodes under changing climate conditions.

As an integral component of the EuroGEO initiative launched by the European Commission, this action will support European activities that contribute to the in-situ data strategy of GEO.

This work will benefit from the EEA's unique role as coordinator of the Copernicus In-Situ Component and of the CLIMATE-ADAPT platform, as well as its role as a lead in the work carried out within GEO on in-Situ Earth Observation data.

Indicative duration: 36 months.

Type of Action: Service Level Agreement

Indicative timetable: First quarter of 2024

Indicative budget: EUR 2.00 million from the 2024 budget

6. Leveraging and promoting the EU Ocean Observation assets within the GEO Blue Planet and G7 Future of the Seas and Oceans Initiatives

Initiated through the EU Partnership Instrument, EU4OceanObs⁵⁵⁴ is an action on international ocean governance to ensure improved cooperation in collecting and using ocean data for societal benefit on a global scale, running from 2020 until 2022.

EU4OceanObs strengthens the international strategy for and coordination of the global ocean observing system by working with two overarching partnerships: the G7, through its Future of the Seas and Oceans initiative⁵⁵⁵ (FSOI), and the GEO⁵⁵⁶ through its GEO Blue Planet initiative. EU4OceanObs showcases Europe's leading-edge capacities and best practices across the ocean observing value chain in order to increase the impact and uptake of European programmes and products beyond Europe and to increase global cooperation and commitment to ocean observation.

The implementation of EU4OceanObs has been delegated to Mercator Ocean International (MOi), a non-profit company created in 2010, providing ocean science-based services of general interest focused on the conservation and the sustainable use of oceans, seas and marine resources. MOi is in charge of implementing of the EU Copernicus Marine Service through a delegation/contribution agreement with the European Commission. MOi is a participating organisation within the GEO intergovernmental initiative where it has an active role in the GEO's Blue Planet initiative. Furthermore, it is a member of EuroGOOS, the European component of the Global Ocean Observing System (GOOS) programme. MOi is

⁵⁵³ See more detail here: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1977.

⁵⁵⁴ <https://www.eu4oceanobs.eu/>

⁵⁵⁵ <https://www.g7fsoi.org>

⁵⁵⁶ <https://www.earthobservations.org>

also a key partner for the implementation of several Horizon 2020 projects in the field of ocean observation and modelling. It has a unique strategic position at the crossroads between ocean observation and forecasting services, research, and international outreach.

In this complex landscape of international programmes and partnerships, and with the EU actions in G7 FSOI and GEO Blue Planet firmly established, this action will deepen and refine the next phase of EU4OceanObs (EU4OceanObs 2.0) for 2023-2026 through the following targets:

- develop the framework for engagement between EU and international initiatives and programmes in the field of ocean observation and ocean forecasting that work across the value-chain ‘collect-transform-share-use’ and promote synergies through mutually-beneficial activities between them;
- provide support for policy coordination and EU guidance in the G7 FSOI, the G7 Ocean Navigation Plan for the UN Decade of Ocean Science for Sustainable Development (hereafter, the UN Ocean Decade), GOOS, and GEO Blue Planet;
- provide support and visibility to EU initiatives in UN Ocean Decade programmes⁵⁵⁷ such as ForeSea, CoastPredict, DITTO, Marine Life 2030, Ocean Observing Co-Design and Ocean Practices;
- advocate European interest in the scientific steering boards, technical management and awareness actions of GOOS, G7 FSOI and GEO Blue Planet;
- increase programmatic links with international initiatives, providing an essential link between the G7 FSOI and GEO Blue Planet to the ocean observation ‘collect-transform-share-use’ value-chain;
- help increase efforts to promote EU Ocean Observation products and services in key regions (e.g., Africa, the Arctic) and to improve in situ data collection.

These targets will be developed further through this action that will, in particular, work on:

- global observation requirements based on modelling data assimilation and modelling systems (particularly addressing climate, biogeochemistry/biological / ecosystem variables);
- transformation of user requirements into global ocean observation and ocean prediction strategies and implementation plans;
- development of use cases that highlight the full knowledge value chain (observation, modelling, services);

⁵⁵⁷ <https://www.oceandecade.org/>

- addressing specific gaps in ocean observations such as ocean acidification, and the specific case of under sampled areas, e.g. the Southern Ocean, polar regions and the deep ocean.

Specific objectives for the two programmes over 2023-2026 are:

The G7 FSOI will prioritise strategic activities to enhance ocean observations and data sharing, particularly in relation to:

- global ocean observing governance and funding coordination;
- continued advocacy and support for the implementation of the global BGC Argo array;
- an internationally-agreed surface ocean CO₂ monitoring strategy to monitor ocean uptake of CO₂ and ocean acidification;
- a global strategy for marine life observation and forecasting;
- a global ocean monitoring indicator framework.
- seamless data integration and needs for international cooperation on ocean reanalysis, analysis and forecasting to support the development of a Digital Twin Ocean.
- sharing experiences and best practices in moving towards net zero carbon emissions ocean capabilities.
- establishing an observing system evaluation framework to guide integrated system design and evolution.

Geo Blue Planet will strengthen linkages with stakeholders to promote and co-design tools for informed decision making based on ocean observations for a sustainable governance of the global ocean for the benefit of society, by:

- further developing and creating thematic working groups in areas relevant to the EU and the global GEO community, bridging the gap between scientific knowledge from ocean observations and society (e.g. on climate adaptation and mitigation, on monitoring the impacts of human activities on ocean health or on improving forecast of water-borne disease outbreaks);
- further identifying user needs for information and services based on ocean observations to support EU priority policies, EU programmes and international partners;
- developing strategies to co-design and support interoperable ocean stewardship decision-support tools based on ocean observations, readily adaptable to various themes and regions in line with user needs;
- leveraging the many ocean-relevant GEO actions to support the GEO Member States in their efforts to deliver on the objectives of the UN Ocean Decade;

- providing an over-arching frame for stakeholder engagement of the UN Ocean Decade endorsed actions, based on GEO Blue Planet experience and greater GEO work programme.

Expected results:

The action is expected to contribute to the following outcomes:

- make the EU more visible as a global actor, and promote its interests and strengthen its influence in international decision-making bodies that address ocean observations;
- enable the development of marine and maritime applications, including related user interaction and user-engagement activities, in line with the requirement under the EU Green Deal and Horizon Missions and in support of the 2030 Agenda for Sustainable Development and international ocean governance;
- increase EU contributions and benefits in two overarching and complementary international initiatives and programmes that work across the ocean observations value chain from observation to users:
 1. GEO Blue Planet⁵⁵⁸, the ocean and coastal arm of GEO promoting the sustained development and use of ocean observations for the benefit of society;
 2. The G7 Future of the Seas and Oceans Initiative⁵⁵⁹ Coordination Centre, working in close collaboration with the IOC-WMO-UNEP-ISC Global Ocean Observing System (GOOS) to enhance global observations.

This grant will be awarded without a call for proposals in accordance with Article 195(e) of the Financial Regulation and Article 20 of the Horizon Europe framework programme and rules for participation.

MOi is a non-profit organisation, in the process of being transformed into an intergovernmental organisation, providing ocean science-based services of general interest focused on the conservation and the sustainable use of the oceans, seas and marine resources. After running the European MyOcean projects since 2009, MOi was officially appointed by the European Commission in 2014 to set up the European ocean-monitoring service, the Copernicus Marine Service (CMEMS), which forms part of the European Earth observation programme, Copernicus.

MOi was selected because of the high level of technical expertise needed and because they had already implemented the European Office of the GEO Blue Planet, an initiative launched via an FPI action. The European Commission's Service for Foreign Policy Instruments (FPI) has initiated a long-term strategy on global international in-situ observation to complement satellite observation, embodied in the Action "International ocean governance: EU component to global observations". The Action was carried out by the EU4OceanObs project, which was

⁵⁵⁸ <https://geoblueplanet.org/>

⁵⁵⁹ <https://www.g7fsoi.org/>

entrusted by the European Commission to MOi. Continuity of services was specifically requested when starting the FPI action.

Legal entities:

MERCATOR OCEAN INTERNATIONAL, Avenue de l'Aérodrome de Montaudran, 31 400 Toulouse, France

Form of Funding: Indirectly managed actions

Type of Action: Indirectly managed action

Indicative timetable: Fourth quarter of 2023

Indicative budget: EUR 3.50 million from the 2023 budget

7. Knowledge Centre for Bioeconomy support action and implementation action of integrated land use assessment

The improvement of the current system of strategic intelligence is needed in order to analyse the knowledge on, and monitor the progress of, the EU bioeconomy. The Bioeconomy Knowledge Centre will present both the state of advancement and the results of a systematic policy-watch, market-watch and science and technology-watch. Special attention will be paid to integrated bioeconomy land-use assessments, presentations and analyses of market developments, national bioeconomy strategies, regional smart specialisation strategies, skills availability and future requirements, infrastructures, services, etc. Research activities conducted under the action might include identifying indicators to monitor economic, social and environmental development, and accounting for ecosystem services of the EU bioeconomy. Other activities might relate to disseminating the above-mentioned knowledge and monitoring outputs.

Form of Funding: Direct action grants

Type of Action: Provision of technical/scientific services by the Joint Research Centre

Indicative timetable: First half of 2023

Indicative budget: EUR 3.00 million from the 2023 budget

8. Studies, conferences, events and outreach activities

A number of specific contracts will be signed under existing framework contracts to:

- (i) support the dissemination and exploitation of project results;
- (ii) contribute to the definition of future challenge priorities;
- (iii) carry out specific evaluations of programme parts;
- (iv) organise conferences, events and outreach activities.

Should existing framework contracts prove unsuitable or insufficient to support these activities, one or more calls for tender may be launched, as appropriate. The contracts envisaged cover the following subjects: studies, technical assistance, conferences, events and outreach activities.

Form of Funding: Procurement

Type of Action: Public procurement

Indicative timetable: throughout 2023 and 2024

Indicative budget: EUR 0.80 million from the 2023 budget and EUR 0.60 million from the 2024 budget

9. Experts assisting in monitoring of actions (grant agreement, grant decision, public procurement, financial instruments)

This action will support the use of appointed independent experts for the monitoring of running actions (grant agreement, grant decision, public procurement actions, financial instruments) funded under Horizon Europe and previous Framework Programmes for Research and Innovation, and where appropriate include ethics checks, as well as compliance checks regarding the Gender Equality Plan eligibility criterion.

Form of Funding: Other budget implementation instruments

Type of Action: Expert contract action

Indicative budget: EUR 0.50 million from the 2023 budget and EUR 1.50 million from the 2024 budget

Budget⁵⁶⁰

	Budget line(s)	2023 Budget (EUR million)	2024 Budget (EUR million)
Calls			
HORIZON-CL6-2023-BIODIV-01		184.00	30.00
	<i>from</i> <i>01.020260</i>	<i>184.00</i>	<i>30.00</i>
HORIZON-CL6-2024-BIODIV-01			76.00
	<i>from</i> <i>01.020260</i>		<i>76.00</i>
HORIZON-CL6-2024-BIODIV-02			36.00
	<i>from</i> <i>01.020260</i>		<i>36.00</i>
HORIZON-CL6-2023-FARM2FORK-01		196.50	92.50
	<i>from</i> <i>01.020260</i>	<i>196.50</i>	<i>92.50</i>
HORIZON-CL6-2024-FARM2FORK-01			95.00
	<i>from</i> <i>01.020260</i>		<i>95.00</i>
HORIZON-CL6-2024-FARM2FORK-02			69.00
	<i>from</i> <i>01.020260</i>		<i>69.00</i>
HORIZON-CL6-2023-CIRCBIO-01		98.50	
	<i>from</i> <i>01.020260</i>	<i>98.50</i>	
HORIZON-CL6-2023-CIRCBIO-02		80.00	
	<i>from</i>	<i>80.00</i>	

⁵⁶⁰ The budget figures given in this table are rounded to two decimal places. The budget amounts are subject to the availability of the appropriations provided for in the general budget of the Union for years 2023 and 2024.

Horizon Europe - Work Programme 2023-2024
Food, Bioeconomy, Natural Resources, Agriculture and Environment

	<i>01.020260</i>		
HORIZON-CL6-2024-CIRCBIO-01			74.50
	<i>from 01.020260</i>		74.50
HORIZON-CL6-2024-CIRCBIO-02			73.00
	<i>from 01.020260</i>		73.00
HORIZON-CL6-2023-ZEROPOLLUTION-01		64.50	
	<i>from 01.020260</i>	64.50	
HORIZON-CL6-2023-ZEROPOLLUTION-02		15.00	
	<i>from 01.020260</i>	15.00	
HORIZON-CL6-2024-ZEROPOLLUTION-01			38.00
	<i>from 01.020260</i>		38.00
HORIZON-CL6-2024-ZEROPOLLUTION-02			23.00
	<i>from 01.020260</i>		23.00
HORIZON-CL6-2023-CLIMATE-01		86.00	22.00
	<i>from 01.020260</i>	86.00	22.00
HORIZON-CL6-2024-CLIMATE-01			75.00
	<i>from 01.020260</i>		75.00
HORIZON-CL6-2023-COMMUNITIES-01		38.50	
	<i>from 01.020260</i>	38.50	
HORIZON-CL6-2024-COMMUNITIES-01			15.00
	<i>from 01.020260</i>		15.00

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HORIZON-CL6-2024-COMMUNITIES-02			22.00
	<i>from</i> <i>01.020260</i>		22.00
HORIZON-CL6-2023-GOVERNANCE-01		130.00	20.00
	<i>from</i> <i>01.020260</i>	130.00	20.00
HORIZON-CL6-2023-GOVERNANCE-02		4.00	
	<i>from</i> <i>01.020260</i>	4.00	
HORIZON-CL6-2024-GOVERNANCE-01			133.50
	<i>from</i> <i>01.020260</i>		133.50
Contribution from this part to call HORIZON-MISS-2023-OCEAN-SOIL-01 under Part 12 of the work programme		6.95	
	<i>from</i> <i>01.020260</i>	6.95	
Contribution from this part to call HORIZON-MISS-2023-CLIMA-OCEAN-SOIL-01 under Part 12 of the work programme		4.88	
	<i>from</i> <i>01.020260</i>	4.88	
Contribution from this part to call HORIZON-MISS-2023-OCEAN-01 under Part 12 of the work programme		3.89	
	<i>from</i> <i>01.020260</i>	3.89	
Contribution from this part to call HORIZON-MISS-2023-CIT-02 under Part 12 of the work programme		0.42	
	<i>from</i> <i>01.020260</i>	0.42	
Contribution from this part to call HORIZON-MISS-2023-CIT-01 under Part 12 of the work programme		3.38	
	<i>from</i> <i>01.020260</i>	3.38	
Contribution from this part to call HORIZON-MISS-2023-CLIMA-01 under Part 12 of the work programme		8.87	
	<i>from</i> <i>01.020260</i>	8.87	

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Contribution from this part to call HORIZON-MISS-2023-SOIL-01 under Part 12 of the work programme		103.95	
	<i>from 01.020260</i>	<i>103.95</i>	
Contribution from this part to call HORIZON-MISS-2023-CLIMA-CITIES-01 under Part 12 of the work programme		3.83	
	<i>from 01.020260</i>	<i>3.83</i>	
Other actions			
Indirectly managed action		7.25	
	<i>from 01.020260</i>	<i>7.25</i>	
Public procurement		0.80	0.60
	<i>from 01.020260</i>	<i>0.80</i>	<i>0.60</i>
Subscription action		1.20	1.20
	<i>from 01.020260</i>	<i>1.20</i>	<i>1.20</i>
Provision of technical/scientific services by the Joint Research Centre		3.00	2.60
	<i>from 01.020260</i>	<i>3.00</i>	<i>2.60</i>
Service Level Agreement			2.00
	<i>from 01.020260</i>		<i>2.00</i>
Expert contract action		0.50	1.50
	<i>from 01.020260</i>	<i>0.50</i>	<i>1.50</i>
Contribution from this part to Specific grant agreement under Part 12 of the work programme		6.02	
	<i>from 01.020260</i>	<i>6.02</i>	
Contribution from this part to Expert contract action under Part 12 of the work programme		0.34	
	<i>from 01.020260</i>	<i>0.34</i>	

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Contribution from this part to Indirectly managed action under Part 12 of the work programme		4.15	
	<i>from 01.020260</i>	<i>4.15</i>	
Estimated total budget		1056.44	902.40