

EN

Horizon Europe

Work Programme 2023-2024

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

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Introduction	13
Destination – Biodiversity and ecosystem services.....	20
Heading 1 – Understanding and addressing the main drivers of biodiversity loss	21
HORIZON-CL6-202X-BIODIV: Invasive alien species	21
HORIZON-CL6-202X-BIODIV: Plant pollinator networks and cascading effects in ecosystems.....	23
HORIZON-CL6-202X-BIODIV: Chemical pollution and biodiversity	24
HORIZON-CL6-202X-BIODIV: Impact of light and noise pollution on biodiversity	25
HORIZON-CL6-2023-BIODIV: Interdisciplinary Assessment of Ecosystems Change, Vulnerability and Response to Natural and Anthropogenic Pressures in Terrestrial and Freshwater Ecosystems building on Earth and Environmental Observation	25
Heading 2 – Biodiversity protection and restoration	27
HORIZON-CL6-202X-BIODIV: Digital for nature	27
HORIZON-CL6-202X-BIODIV: Nature protection.....	29
HORIZON-CL6-202X-BIODIV: Understanding and reducing bycatch of protected species	30
HORIZON-CL6-2024-BIODIV: Restoration of deep-sea habitats.....	32
HORIZON-CL6-2024-BIODIV: Demonstration of marine and coastal infrastructures as hybrid blue-grey Nature-based Solutions.....	34
Heading 3 – Mainstreaming biodiversity in society and the economy	35
HORIZON-CL6-202X-BIODIV: Dependence of society and the economy on pollinators	35
HORIZON-CL6-2023-BIODIV: Improving higher education governance and skills development for biodiversity and Nature-based Solutions	36
HORIZON-CL6-2024-BIODIV: Demonstrating Nature-based Solutions for the sustainable management of water resources in a changing climate, to reduce the impacts of droughts	38
HORIZON-CL6-2023-BIODIV: Biodiversity, economics and finance	39
HORIZON-CL6-2023-BIODIV: Build up the knowledge on “Nature- Based Economy” (NBE) and support its emergence and usage in the current economic approaches.....	42
HORIZON-CL6-2023-BIODIV: Biodiversity loss and enhancing ecosystem services in urban and periurban areas	44
HORIZON-CL6-2024-BIODIV: Impact of digital transformation, and delivery of governance tools and policy mixes for transformative action on biodiversity	46
HORIZON-CL6-2023-BIODIV: Contribution to the reinforcement of science policy support to better interconnected biodiversity and climate policies	48
Heading 4 – Biodiversity friendly practices in agriculture, forestry and aquaculture....	50
HORIZON-CL6-2023-BIODIV: Conservation and use of genetic diversity for sustainable agriculture: focus on crop wild relatives	50
HORIZON-CL6-2023-BIODIV: Biodiversity friendly practices in agriculture – breeding for Integrated Pest Management (IPM).....	50

HORIZON-CL6-202X-BIODIV: Promoting pollinator friendly farming systems	52
HORIZON-CL6-2024-BIODIV: Promoting minor crops in farming systems	53
HORIZON-CL6-2024-BIODIV: Reintroduction of landscape features in intensive agricultural areas	54
HORIZON-CL6-2024-BIODIV: Maximising the synergies and minimising of trade-offs in the conservation and protection of endangered carbon-rich and biodiversity-rich forest ecosystems.....	55
HORIZON-CL6-20XX-BIODIV: Selective breeding programme for organic aquaculture	56
Heading 5 – Interconnection of biodiversity research and policies	58
HORIZON-CL6-2023-BIODIV: European Biodiversity Partnership: Biodiversa+ (second instalment).....	58
Heading 6 – Biodiversity and health.....	61
HORIZON-CL6-2023-BIODIV: Prevention of zoonotic emerging diseases & biodiversity	61
 Destination – Fair, healthy and environment-friendly food systems from primary production to consumption	 63
Heading 1 – Enabling sustainable farming systems.....	69
HORIZON-CL6-2023-FARM2FORK: European partnership on accelerating farming systems transition: agroecology living labs and research infrastructures	69
HORIZON-CL6-2023-FARM2FORK: European partnership on animal health and welfare	71
HORIZON-CL6-2023-FARM2FORK: Increasing the availability and use of harmless inputs in organic farming	73
HORIZON-CL6-2024-FARM2FORK: Improving yields in organic crop systems	74
HORIZON-CL6-2023-FARM2FORK: Valorisation of ecosystem services provided by legume crops	76
HORIZON-CL6-2024-FARM2FORK: Tools to increase the effectiveness of EU import controls for plant health.....	77
HORIZON-CL6-2024-FARM2FORK: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution.....	78
HORIZON-CL6-2024-FARM2FORK: Emerging and future risks to plant health	80
HORIZON-CL6-2023-FARM2FORK: Tackling outbreaks of plant pests.....	81
HORIZON-CL6-2023-FARM2FORK: Animal welfare in transport and at slaughter (<i>in reserve, depending on partnership animal health and welfare</i>)	83
HORIZON-CL6-2023-FARM2FORK: Enhancing animal welfare friendly non-caged farming (<i>in reserve, depending on partnership animal health and welfare</i>)	84
HORIZON-CL6-2023-FARM2FORK Advancing vaccine development for African swine fever (<i>in reserve, depending on partnership animal health and welfare</i>).....	85
HORIZON-CL6-2024-FARM2FORK: Alternatives to traditional antimicrobial medicinal products (<i>in reserve, depending on partnership animal health and welfare</i>)	86

HORIZON-CL6-2024-FARM2FORK: Animal nutritional requirements and nutritional value of feed under different management conditions	87
HORIZON-CL6-2024-FARM2FORK: Agro-pastoral/outdoor livestock systems and wildlife management	88
HORIZON-CL6-2023-FARM2FORK: Towards sustainable livestock systems: European platform for evidence building and transitioning policy	89
HORIZON-CL6-2023-FARM2FORK: Exploring markets of agricultural inputs to support farmers' decision-making	90
HORIZON-CL6-2023-FARM2FORK: Investigating geographical indications (GIs) contribution to sustainable development and optimising support for newly established schemes	91
HORIZON-CL6-2024-FARM2FORK: New business (and production) models improving farmers' position in value chains and enabling transition to sustainable agriculture.....	93
HORIZON-CL6-2024-FARM2FORK: Sustainable organic food innovation labs: focus on minimal, on-farm processing & circular value chains	94
Heading 2 – Enabling sustainable fisheries and aquaculture	95
HORIZON-CL6-2024-FARM2FORK: Using species automatic recognition and artificial intelligence to fight illegal fish discards and revolutionise fisheries control.....	95
HORIZON-CL6-2024-FARM2FORK: Minimising climate impact on fisheries: mitigation and adaptation solutions for future climate regimes	97
HORIZON-CL6-2024-FARM2FORK: Minimising climate impact on aquaculture: mitigation and adaptation solutions for future climate regimes.....	99
Heading 3 – Transforming food systems for health, sustainability and inclusion	100
HORIZON-CL6-2023-FARM2FORK: European partnership on safe and sustainable food systems for people, plant and climate	100
HORIZON-CL6-2023-FARM2FORK: Fostering resilient European food systems in a changing world.....	101
HORIZON-CL6-2023-FARM2FORK: Eradicate micronutrient deficiencies in the EU ..	102
HORIZON-CL6-2024-FARM2FORK: New healthy and sustainable food products and processes.....	105
HORIZON-CL6-2023-FARM2FORK: Traceability strategies and detection methods on products derived from new genomic techniques to enable safe innovation in the food system.....	106
HORIZON-CL6-2023-FARM2FORK: Ensuring food safety by translating research and innovation into practice	109
HORIZON-CL6-2024-FARM2FORK: Climate change and food safety: effects of climate change on food safety hazards across food systems	110
HORIZON-CL6-2024-FARM2FORK: Tackling food fraud by translating research and innovation into practice	112
HORIZON-CL6-2024-FARM2FORK: Creating smart and attractive tools to enhance healthy and sustainable diets at home	113

HORIZON-CL6-2024-FARM2FORK: Citizens’ science as an opportunity to foster the transition to sustainable food systems	114
HORIZON-CL6-2023-FARM2FORK: Cultured meat and seafood – state of play and future prospects in the EU from social, environmental, economic and ethical point of views	116
HORIZON-CL6-2024-FARM2FORK: Impact of development of novel foods based on alternative sources of proteins	118
HORIZON-CL6-2023-FARM2FORK: Optimising marketing standards at retail and consumption level to prevent/reduce food waste	119
HORIZON-CL6-2024-FARM2FORK: Preventing and reducing food loss and waste to help reach 2030 climate targets	121
HORIZON-CL6-2023-FARM2FORK: Microbiomes fighting food waste through applicable solutions in food processing, packaging and shelf life	123
HORIZON-CL6-2024-FARM2FORK: Microbiome as a flavour and 3rd pillar in the alternative protein of food industry	124
Heading 4 – Targeted international cooperation	126
HORIZON-CL6-2023-FARM2FORK: EU-AU cooperation – linking FNSSA and PANAP activities	126
HORIZON-CL6-2023-FARM2FORK: Long-term sustainable platform for the EU-AU cooperation under the FNSSA partnership.....	127
HORIZON-CL6-2024-FARM2FORK: Agro-forestry management for climate change adaptation and mitigation	129
HORIZON-CL6-2023-FARM2FORK: Support to the agro-ecological markets and trade under the FNSSA partnership	130
HORIZON-CL6-2024-FARM2FORK: Setting up living laboratories in Africa.....	132
HORIZON-CL6-2024-FARM2FORK: Earth observation for sustainable African food systems in view of climate change	132
HORIZON-CL6-2023-FARM2FORK: EU-African Union – climate-neutral, social just fair trade food systems	133
HORIZON-CL6-202X-FARM2FORK: EU-Africa Union – food safety	135
Destination – Circular economy and bioeconomy sectors.....	137
Heading 1 – Enabling a circular economy transition.....	140
HORIZON-CL6-2023-CIRCBIO: Circular Cities and Regions Initiative (CCRI)’s circular systemic solutions	140
HORIZON-CL6-2023-CIRCBIO: Circular Cities and Regions Initiative’s project development assistance (CCRI-PDA).....	142
HORIZON-CL6-2023-CIRCBIO: Enhancing collaboration between Circular Cities and Regions Initiative's (CCRI) supporting organisations.....	143
HORIZON-CL6-2023-CIRCBIO: Novel sustainable and circular bio-based textiles.....	144
HORIZON-CL6-2024-CIRCBIO: Circular solutions for textile value chains based on extended producer responsibility	146

HORIZON-CL6-2024-CIRCBIO: Circular solutions for textile value chains through innovative sorting, recycling, and design for recycling	147
HORIZON-CL6-2023-CIRCBIO: One hundred circular model households: making European households sustainable through inclusive circular practices.....	148
HORIZON-CL6-2024-CIRCBIO: Innovative circular solutions for furniture	149
HORIZON-CL6-2024-CIRCBIO: Systemic circular solutions for a sustainable tourism.	150
HORIZON-CL6-2024-CIRCBIO: Increasing the circularity in plastics value chains.....	152
HORIZON-CL6-2024-CIRCBIO: Increasing the circularity in electronics value chains .	153
HORIZON-CL6-2023-CIRCBIO: Harnessing the innovation potential and market uptake of successful circular economy water related projects	154
HORIZON-CL6-2024-CIRCBIO: New circular solutions and decentralised approaches for water and wastewater management.....	156
Heading 2 – Innovating for sustainable bio-based systems and the bioeconomy.....	157
HORIZON-CL6-2023-CIRCBIO: Non-plant biomass feedstocks for industrial applications – processes to convert non-lignocellulosic biomass and waste into bio-based chemicals, materials and products to improve the cascading valorisation of biomass	157
Specific conditions	157
HORIZON-CL6-2023-CIRCBIO: Land-based bioprospecting and production of bioactive compounds and functional materials for multiple bio-based value chains	159
HORIZON-CL6-2023-CIRCBIO: Broadening the spectrum of enzymes and microbial hosts in industrial biotechnology.....	161
HORIZON-CL6-2023-CIRCBIO: Bio-based solutions for humanitarian applications.....	163
HORIZON-CL6-2023-CIRCBIO: Symbiosis in the bio-based industrial ecosystems.....	165
HORIZON-CL6-2023/2024-CIRCBIO: Eco- and circular-by-design bio-based technologies/materials	166
HORIZON-CL6-2023-CIRCBIO: Programmed biodegradation capability of bio-based materials and products, validated in specific environments including extreme environments	167
HORIZON-CL6-2023/2024-CIRCBIO: Digital information systems for bio-based products	169
HORIZON-CL6-2023-CIRCBIO: Eco-friendly consumer products – low-toxicity/zero pollution construction bio-based materials	170
HORIZON-CL6-2023-CIRCBIO: Business models that balance the share of power and profit in the bioeconomy	172
HORIZON-CL6-2024-CIRCBIO: From silos to diversity – small-scale bio-based demonstration pilots	173
Heading 3 – Innovating for blue bioeconomy and biotechnology value chains.....	174
HORIZON-CL6-2023-CIRCBIO: Novel culture of marine organisms for blue biotechnology applications.....	174
HORIZON-CL6-2024-CIRCBIO: Targeting marine extremophiles for sourcing novel enzymes, drugs and chemicals	175

Heading 4 – Safeguarding and sustainably innovating the multiple functions of EU forests.....	177
HORIZON-CL6-2023-CIRCBIO: Optimising the sustainable production of wood and non-wood products in small forest properties and development of new forest-based value chains	177
HORIZON-CL6-2023-CIRCBIO: Capturing market trends and societal perceptions for tailor-made forest ecosystem services	178
HORIZON-CL6-2023-CIRCBIO: Monitoring the multi-functionality of European forests	179
Destination – Clean environment and zero pollution	181
Heading 1 – Halting emissions of pollution to air, soil and water	183
HORIZON-CL6-2023-ZEROPOLLUTION: Optimisation of manure use along the management chain to mitigate GHG emissions and minimize nutrients/contaminants dispersion in the environment	183
HORIZON-CL6-2023-ZEROPOLLUTION: Best available techniques recovering/recycling fertilising products from secondary raw materials	184
HORIZON-CL6-2024-ZEROPOLLUTION: Demonstrating how regions can operate within safe regional nitrogen and phosphorus boundaries	186
HORIZON-CL6-2023-ZEROPOLLUTION: Knowledge and innovative solutions in agriculture for water availability and quality	187
Heading 2 – Protecting drinking water and managing urban water pollution	188
HORIZON-CL6-2024-ZEROPOLLUTION: Holistic approaches at city/catchment level ensuring resilient water quality in urban areas	188
Heading 3 – Addressing pollution in seas and ocean	190
HORIZON-CL6-2023-ZEROPOLLUTION: Integrated assessment and monitoring of emerging pollutants	190
HORIZON-CL6-2024-ZEROPOLLUTION: A changing Arctic – pollution pressures in a climate change world	191
Heading 4 – Increasing environmental performances and sustainability of processes and products.....	193
HORIZON-CL6-2023/2024-ZEROPOLLUTION: Innovative technologies for zero pollution, zero-waste biorefineries	193
HORIZON-CL6-2023-ZEROPOLLUTION: Safe-and-sustainable-by-design bio-based platform chemicals, additives or products as alternatives	194
HORIZON-CL6-2024-ZEROPOLLUTION: Environmental sustainability and circularity criteria for bio-based systems.....	195
HORIZON-CL6-2023/2024-ZEROPOLLUTION: Methodologies for assessing environmental and circular performances of processes and products underpinned by cutting-edge biotech and bio-based technologies.....	197

HORIZON-CL6-2023-ZEROPOLLUTION: Industrial biotechnology approaches for improved sustainability and output of industrial bio-based processes	199
HORIZON-CL6-2023-ZEROPOLLUTION: Biosensors and user-friendly diagnostic tools for environmental services	200
Heading 5 – Reducing the environmental impact and pollution in food systems	201
HORIZON-CL6-202X-ZEROPOLLUTION: Environmental impacts of food systems ...	201
HORIZON-CL6-202X-ZEROPOLLUTION: Strategies to reduce plastic pollution from the food system	203
Destination – Land, ocean and water for climate action	205
HORIZON-CL6-2023/2024-CLIMATE: European Partnership Water Security for the Planet (Water4All)	208
HORIZON-CL6-2023-CLIMATE: Improve the reliability and effectiveness of alternative water resources supply systems and technologies.....	212
HORIZON-CL6-2023-CLIMATE: Ocean and coastal waters carbon- and biodiversity-rich ecosystems and habitats in Europe and the polar regions	214
HORIZON-CL6-2024-CLIMATE: Improve irrigation practices and technologies in agriculture.....	217
HORIZON-CL6-2023-CLIMATE: Demonstration network on climate-smart farming – linking research stations	218
HORIZON-CL6-2023-CLIMATE: Pilot network of climate positive organic farms	220
HORIZON-CL6-2023-CLIMATE: Socio-economic aspects of paludiculture	222
HORIZON-CL6-2023-CLIMATE: Energy prices and farming	223
HORIZON-CL6-2023-CLIMATE: Enhancing the sustainable production of renewable energy at farm-level	224
HORIZON-CL6-2024-CLIMATE: Paludiculture: large-scale demonstrations.....	225
HORIZON-CL6-2024-CLIMATE: Readiness of farmers to change production to adapt.	226
HORIZON-CL6-2024-CLIMATE: Land use change and local / regional climate.....	227
HORIZON-CL6-2024-CLIMATE: Climate-smart use of wood in the construction sector to support the New European Bauhaus	228
HORIZON-CL6-2024-CLIMATE: Closing the research gaps on ocean essential climate variables (ECVs) in support of global assessments (IPCC, WOA, IPBES, and UN Decade)	229
HORIZON-CL6-2024-CLIMATE: Ocean models for seasonal to decadal and local to regional climate predictions	232
HORIZON-CL6-2023/2024-CLIMATE: Environmental and Earth Observation for improving joint climate (mitigation and adaptation) and biodiversity monitoring on land	234
Destination – Resilient, inclusive, healthy and green rural, coastal and urban communities.....	237

HORIZON-CL6-2023-COMMUNITIES: Enhancing social inclusion in rural areas: Focus on vulnerable groups and social economy	241
HORIZON-CL6-2023-COMMUNITIES: Improving rural futures through better territorial governance and rural-urban synergies.....	242
HORIZON-CL6-2023-COMMUNITIES: International benchmarking of rural and territorial policies and delivery mechanisms.....	244
HORIZON-CL6-2024-COMMUNITIES: Innovating for climate-neutral rural communities by 2050	245
HORIZON-CL6-2024-COMMUNITIES: Societal perceptions and benefits of rural life and jobs: will COVID generate a long-lasting shift?	246
HORIZON-CL6-2024-COMMUNITIES: Scaling-up the adoption of business models fit for the future.....	247
HORIZON-CL6-2023-COMMUNITIES: Assessing urban farming impacts and related risks	248
HORIZON-CL6-2023-COMMUNITIES: Unlock potential of the New European Bauhaus in urban food system transformation.....	250
HORIZON-CL6-2023-COMMUNITIES: Inclusive and smart ways to communicate sustainability of food.....	251
HORIZON-CL6-2024-COMMUNITIES: Demonstrating the potential of Nature-based Solutions and the New European Bauhaus to contribute to sustainable, inclusive and resilient communities	253
HORIZON-CL6-2024-COMMUNITIES: Traditional knowledge, indigenous peoples, and co-creation of knowledge for social and environmental innovation in the Arctic/Atlantic	255

Destination – Innovative governance, environmental observations and digital solutions in support of the Green Deal..... 257

Heading 1 – Innovating with governance models and supporting policies..... 261

HORIZON-CL6-2023-GOVERNANCE: European Partnership for a climate-neutral, sustainable and productive Blue Economy	261
HORIZON-CL6-2023-GOVERNANCE: European Partnership of Agriculture of Data ..	267
HORIZON-CL6-2023-GOVERNANCE: Advancing analytical (modelling) capacity and tools to support sustainable EU agri-food policies post 2030.....	268
HORIZON-CL6-2023-GOVERNANCE: Towards CAP post 2030: evidence on nudging farmers to leverage more sustainable practices and behaviours.....	269
HORIZON-CL6-2023-GOVERNANCE: Regional ecosystems of innovation to foster place-based quadruple helix food systems innovation for co-benefits.....	269
HORIZON-CL6-2024-GOVERNANCE: Developing an interdisciplinary and inclusive pan-European academic network for food system science	270
HORIZON-CL6-2024-GOVERNANCE: The role of mainstream media, social media and marketing in fostering healthy and sustainable consumption patterns and how to encourage good practice or incentives.....	272
HORIZON-CL6-2023-GOVERNANCE: Revitalisation of European local (rural / peri-urban) communities with innovative bio-based business models and social innovation...	273

HORIZON-CL6-2023-GOVERNANCE: Co-creation and trust-building measures for biotechnology and bio-based innovation systems	275
HORIZON-CL6-2024-GOVERNANCE: Supporting the transition from GHG-intensive economies facing challenges to meet the objectives under the European Green Deal towards circular bioeconomy model regions	276
HORIZON-CL6-2024-GOVERNANCE: Demonstrating the transition from GHG-intensive economies facing challenges to meet the objectives under the European Green Deal towards circular bioeconomy model regions	278
HORIZON-CL6-2024-GOVERNANCE: Bioeconomy project development assistance ..	279
HORIZON-CL6-2023-GOVERNANCE: Integrated assessment of land use and biomass demands to contribute to a sustainable healthy and fair bioeconomy	280
HORIZON-CL6-2023-GOVERNANCE: Mobilising networks for the development of national bioeconomy action programmes in support of the European Green Deal	282
HORIZON-CL6-2024-GOVERNANCE: All-Atlantic Ocean Research Alliance - Implementing the Belem and Galway Statements and the future ambition	284
Heading 2 – Deploying and adding value to Environmental Observations	285
HORIZON-CL6-2023/2024-GOVERNANCE: Customisation/pre-operationalisation of prototypes end-user services in the area of Climate Change Adaptation and Mitigation ..	285
HORIZON-CL6-2023-GOVERNANCE: Coordination and supporting action to increase synergies in the dissemination and exploitation of climate observation by World Metrological Organization and its subsidiary bodies	287
HORIZON-CL6-2023-GOVERNANCE: Support to EuroGEO initiative coordination/establishing a EuroGEO secretariat	289
HORIZON-CL6-2024-GOVERNANCE: Development of applications under the EuroGEO initiative	290
HORIZON-CL6-2024-GOVERNANCE: Develop innovative applications to support the European Green Deal building on European meteorological satellite data	292
HORIZON-CL6-2023-GOVERNANCE: Decreasing observation gaps in the land-sea interface area	294
HORIZON-CL6-2023-GOVERNANCE: Empowering citizens to monitor, report and act in partnership with relevant public authorities to protect their environment in the context of environmental compliance assurance	295
Heading 3 – Digital and data technologies as key enablers	297
HORIZON-CL6-2023-GOVERNANCE: Strengthening work force and working conditions through digital and data technologies – the potential of robotics and augmented reality in agriculture	297
HORIZON-CL6-2023-GOVERNANCE: Open source solutions in a computing continuum - from edge to cloud - to strengthen production and administrative capacities in agriculture	298
HORIZON-CL6-2023-GOVERNANCE: Capitalisation of data spaces for public interest purposes and the agricultural and forestry sectors	299

HORIZON-CL6-2023-GOVERNANCE: Digital and data technologies for livestock tracking.....	300
HORIZON-CL6-2023-GOVERNANCE Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital- and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment.....	301
HORIZON-CL6-2023-GOVERNANCE: Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures	302
HORIZON-CL6-2023-GOVERNANCE: Data-driven solutions to foster industry’s contribution to inclusive and sustainable food system.....	304
HORIZON-CL6-2024-GOVERNANCE: Inclusive usage of beneficial digital technologies to drive uptake of healthy and overall sustainable diets.....	305
Heading 4 – Strengthening agricultural knowledge and innovation systems (AKIS) ...	307
HORIZON-CL6-2023/2024-GOVERNANCE: Broaden EIP Operational Group outcomes across borders by means of thematic networks to compile and share knowledge ready for practice	307
HORIZON-CL6-2023/2024-GOVERNANCE: Thematic networks to compile and share knowledge ready for practice	309
HORIZON-CL6-2023-GOVERNANCE: Organic farming thematic networks to compile and share knowledge ready for practice	312
HORIZON-CL6-2023-GOVERNANCE: Biodiversity thematic networks to compile and share knowledge ready for practice.....	314
HORIZON-CL6-2023-GOVERNANCE: Developing EU advisory networks on organic agriculture.....	317
HORIZON-CL6-2023-GOVERNANCE: Developing EU advisory networks on pesticide use reduction	320
HORIZON-CL6-2023-GOVERNANCE: Developing EU advisory networks on forestry	323
HORIZON-CL6-2023-GOVERNANCE: Developing EU advisory networks on sustainable livestock systems.....	325
Other actions not subject to calls for proposals	330
1. Support to the International Resource Panel (IRP) Secretariat	330
2. (2023) Towards a European Bioeconomy Council	330
3. (2024) Coordination and support service for Circular Cities and Regions Initiative (CCRI).....	331
4. GEO subscription 2023-2024 (XX million, for 2023 and 2024)	332
5. Scientific and technical services by the Joint Research Centre: Leveraging European data-sharing and exploitation practices within GEOSS (Global Earth Observation System of Systems) (XX million, 2024 (for years 2024 – 2026))	333
6. Grant to a named beneficiary to ESA for the GEOSS portal (continuation Geoportals Platform Plus project) (XX million, 2024 (for 2024 – 2025))	333

- 7. Service Level Agreement with EEA “Enhancing the access to in situ Earth observation data in support of climate change adaptation policies and activities” (XX million, 2024 (for 2024 – 2027)) 334
- 8. Support the clustering of ESA-RTD projects in the domain of Earth System Science (ESS projects) (XX million, 2024)..... 334

DRAFT

Introduction

The Horizon Europe mandate for Cluster 6 is to provide opportunities to enhance and balance environmental, social and economic goals and to set human economic activities on a path towards sustainability. The underlying paradigm of Cluster 6 is therefore the need for a transformative change of the EU economy and society in order 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.

Research and Innovation (R&I) in this cluster will contribute to the UN's Sustainable Development Goals and accelerate the ecological transition required by the European Green Deal. Of particular relevance will be SDG 2 – zero hunger; SDG 3 – good health and well-being; SDG 6 - clean water and sanitation; SDG 8 – decent work and economic growth; SDG 9 – industry, innovation, and infrastructure; SDG 11 – sustainable cities and communities; SDG 12 - responsible consumption and production; SDG 13 – climate action, SDG 14 – life below water and SDG 15 - life on land".

Activities in this work programme will contribute to all key strategic orientations (KSOs) of the strategic plan¹, with orientations B and C contributing the most directly. These KSOs are:

- A. 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;
- B. restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources to ensure food security and a clean and healthy environment;
- C. making Europe the first digitally led circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems;
- D. 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 multiple 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)
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¹ <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/3c6ffd74-8ac3-11eb-b85c-01aa75ed71a1>

<p>Climate neutrality is achieved by reducing 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</p>	<ul style="list-style-type: none"> • Land, oceans and water for climate action
<p>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</p>	<ul style="list-style-type: none"> • Biodiversity and ecosystem services
<p>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</p>	<ul style="list-style-type: none"> • Circular economy and bioeconomy sectors • Clean environment and zero pollution
<p>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</p>	<ul style="list-style-type: none"> • Fair, healthy and environmentally-friendly food systems from primary production to consumption
<p>Rural, coastal and urban areas are developed in a sustainable, balanced and inclusive manner thanks to a better understanding of the environmental, socio-economic, behavioural and demographic drivers of change as well as deployment of digital, social and community-led innovations</p>	<ul style="list-style-type: none"> • Resilient, inclusive, healthy and green rural, coastal and urban communities
<p>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</p>	<ul style="list-style-type: none"> • Innovative governance, environmental observations and digital solutions in support of the Green Deal

Activities under Cluster 6 will help to accelerate the ecological transition required by the European Green Deal in order to achieve climate neutrality by 2050. This will be done by preserving Earth’s natural carbon sinks such as soils and plants, forests, farmed lands and

wetlands, substantially reducing GHG from the agricultural sector and transforming 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 to 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. R&I will support the objectives of the EU biodiversity strategy for 2030, the circular economy action plan, the EU zero pollution action plan, the EU industrial strategy, the bioeconomy strategy, the EU forest strategy, the EU soil strategy, the blue growth strategy, the chemicals strategy for sustainability and the EU plastics strategy, in addition to the EU climate policy.

Protecting and restoring the integrity of ecosystems and their capacity to deliver a wide range of essential services, thus putting Europe's biodiversity on a path to recovery by 2030, as required by the EU biodiversity strategy, is fundamental to achieving the European Green Deal objectives. Avoiding loss of biodiversity also has the potential of helping to avoid threats to human health in the future. R&I will address the multiple challenges in this area, including by enabling transformative changes. This cluster will improve knowledge on the causes of biodiversity decline, the role of ecosystems and their services and support their restoration. The cluster deals with agriculture, forestry, aquaculture and fisheries, food and bio-based systems, animal and human health, which directly depend on ecosystem services. These sectors have profound environmental impacts and at the same time are particularly affected by the global environmental changes. 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 at the same time impact 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 achieve effectively the objectives of the farm to fork strategy. It will empower farmers, fishermen 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. At the same time it will also provide consumers with affordable, safe, nutritious, healthy and sustainable food. R&I will also stimulate practices at all stages of the food system from processing to services and the use and valorisation of waste and by-products and surplus management. This will ensure safe and sustainable food and facilitate a shift to sustainable and healthy diets. R&I will also support the design, implementation and monitoring of the common agricultural policy (CAP), the common fisheries policy and the EU General Food Law.

Improved knowledge and innovations will be key to the success of the zero-pollution ambition of the European Green Deal to halt and prevent pollution, and will therefore address 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 the Birds

Directive and the Habitats directive, the pollinators initiative, the revised soil thematic strategy and the EU Water Framework Directive and the maritime policy and the EU Arctic policy.

The cluster will support the development of resilient and vibrant rural, coastal, urban, and peri-urban areas in line with the Commission priority “An economy that works for people”. It will develop new governance models ensuring that no one is left behind to implement the Green Deal initiatives, needed to ensure a fair and just transition. This cluster will help to use, uptake and deploy environmental observation and take advantage of digital solutions in coherence 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.

Horizon Europe is the research and innovation 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 enterprises, and citizens and their representatives, in order to bridge gaps between territories, generations and regional cultures, especially caring for the needs of the young in shaping Europe’s future. Calls could be EU Synergies calls, meaning that projects that have been awarded a grant under the call could have the possibility to 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 ERDF, ESF+, JTF, EMFAF, EAFRD and InvestEU), where appropriate, as well as private funds or financial instruments. The ERDF focuses amongst others on the development and strengthening of regional and local research and innovation 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 industrial research, experimental development and feasibility studies, building research and innovation capacities and uptake of advanced technologies and roll-out of innovative solutions from the Framework Programmes for research and innovation through the ERDF.

The EU’s Recovery and Resilience Facility (RRF) currently available in all Member States aims at financing projects that directly tackle the economic and social impacts from the Coronavirus crisis and support the green and digital transition. For project ideas that directly contribute to these objectives and that have a strong focus in one member state it is advisable to check access to the RRF for a 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.

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, sustainable agriculture, food safety and food and nutrition security.

To be more effective in achieving impact, the proposals shall synergize with relevant initiatives funded at EU level, including the Knowledge and Innovation Communities (KICs) of the European Institute of Innovation and Technology (EIT). The innovation ecosystems created and nurtured by the EIT KICs can in particular contribute to building communities or platforms for coordination and support actions, sharing knowledge or disseminating and fostering the exploitation of the project results. Where relevant the 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.

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

- Life cycle assessment (LCA) and its relevant application to value chain assessment, refer 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, refer to the Raw materials information system (RMIS, <https://rmis.jrc.ec.europa.eu/>)
- Soil and soil related issues, refer to the European Soil Observatory (ESO, <https://ec.europa.eu/jrc/en/eu-soil-observatory>)
- Natural capital accounting, refer to the INCA platform (<https://ec.europa.eu/eurostat/ecosystem-accounts>)
- Biodiversity, refer to the EC Knowledge Centre for Biodiversity, (https://knowledge4policy.ec.europa.eu/biodiversity_en).

Specific requirements for multi-actor projects:

Proposals submitted for topics requesting to follow the multi-actor approach must meet all requirements listed below. The multi-actor approach described here, which is a form of responsible research and innovation, aims to make the R&I process and its outcomes more demand-driven, reliable and relevant to society. This is more than just widely disseminating the results of a project, or listening to the views of a board of stakeholders. A multi-actor project ensures the genuine and sufficient involvement of a targeted diversity of actors, which serves the objectives of the topic. Which relevant key actors participate depends on the objective of the proposal. The actors are essentially the (end-) **users² of the project results** and are backed up by useful intermediaries who can bring in further knowledge relevant to the topic's objectives, such as farmers / farmers' groups, foresters / foresters' groups, fishermen / fishermen's groups, advisors, food processors, businesses, consumer associations, local communities, citizens, civil society organisations including NGOs, government representatives,

² An "(end-) user" of project result is a person who is him/herself putting the project results into practice

etc. The genuine and sufficient involvement of such actors should take place **all over the whole course of the project**: from participation in project planning and experiments to implementation, dissemination of results and a possible demonstration phase. Building blocks for the project proposal are expected to come from science as well as from practice and from intermediaries: it is a 'co-creation' process. End-users and practitioners 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 speed up the acceptance and take-up of new ideas, approaches and solutions developed in the project. Therefore, a multi-actor project proposal must demonstrate:

- how the project proposal's objectives and planning are targeting the needs/problems and opportunities of the (end-)users of the project results;
- how the description of the project concept and in particular the composition of the consortium reflects a balanced choice of key relevant actors who have complementary types of knowledge (scientific and practical), and will ensure a broad implementation of project results which should be useful in practice;
- how the project intends to include existing practices and tacit knowledge in scientific work. This should be illustrated in the project proposal with a sufficient number of high-quality knowledge exchange activities indicating the precise and active roles of the different non-scientific actors in the work. Thanks to the cross-fertilisation of competencies and ideas between actors, this should generate innovative findings and solutions that are more likely to be applied;
- how the project will facilitate the multi-actor engagement process by making use of the most appropriate methodologies;
- the project's added value: how the project will complement existing research and best practices;
- the proposal should demonstrate how the project will result in practical knowledge, approaches or tools, made easily understandable and accessible, and how this free material for practice will feed into the existing dissemination channels most consulted by the (end-) users of the project results in the countries and regions;
- for topics linked to Intervention Area 3, for EU-wide communication, this knowledge should also be assembled in a substantial number of 'practice abstracts' in the common EIP format³ of the European Innovation Partnership (EIP) 'Agricultural Productivity and Sustainability' (EIP-AGRI);

³ The EIP common format for "practice abstracts" is available at: <https://ec.europa.eu/eip/agriculture/en/content/eip-agri-common-format>

- for other topics, this EIP may also be used if they are covered under its innovative areas⁴, as may other similarly effective solutions for dissemination through the main existing dissemination channels targeting (end-)users;
- for topics linked to Intervention Area 3, involvement, as much as possible, of interactive innovation groups operating in the EIP-AGRI context, such as EIP-AGRI Operational Groups funded under Rural Development Programmes.

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⁴ For the innovative areas covered by the EIP 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>

Destination – Biodiversity and ecosystem services

The biodiversity and ecosystem services destination of Cluster 6 work programme 2023-2024 will support research and innovation for the EU environment and biodiversity protection framework and the EU Green Deal. It is based on the vision developed in the EU biodiversity strategy and will support its implementation, furthering the orientations of the work programme 2021-2022. It will also take into account new Green Deal initiatives, notably the EU forest strategy 2030, the EU action plan: 'towards zero pollution for air, water and soil', the EU climate adaptation strategy and the EU soil strategy for 2030. Connections are expected to be made with the future Commission proposal on legally binding nature restoration targets and environmental reporting and the new approach for a sustainable blue economy in the EU⁵.

It will support R&I activities benefitting ecosystems in good ecological condition and a clean and healthy environment for the EU, including water, soil, air, health, climate adaptation and mitigation, disaster risk reduction, sustainable circular bioeconomy and blue economy policies. The R&I activities will also reflect the strong interconnections between the biodiversity strategy and the farm to fork strategy, among others also the pollinators initiative. Connections are expected to be made with the future Commission proposal on legally binding nature restoration targets.

R&I activities supported by Cluster 6 will complement and ensure synergies with activities supported under several Horizon Europe partnerships, in particular Biodiversa+, the European partnership on accelerating farming systems transition: agroecology living labs and research infrastructures, the European partnership on animal health and welfare and the European partnership for a climate-neutral, sustainable and productive Blue Economy. R&I activities should also address in particular the strong interconnections between biodiversity and the emergence of infectious diseases in complementarity 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 and waters by 2030”, “a soil deal for Europe” and “adaptation to climate change”.

This destination will also contribute to the twin green and digital transition. Where relevant, advantage will be taken of the development and the 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 address global challenges in many topics of this destination. Outermost regions of Europe, where biodiversity is high and threats multiply, should be given specific consideration.

Expected impact

⁵ A new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future

Proposals for topics under this destination should set out a credible pathway contributing to the following impact of the Strategic Plan: "*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*", and more specifically to one or more of the following impacts:

- 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.
- Plan, manage and expand **protected areas** based on up-to-date knowledge and solutions.
- 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).
- 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.
- Interconnect **biodiversity research and support policies and processes** at EU and global levels, making use of advanced digital technologies where appropriate.
- Understand **the biodiversity and health nexus, in particular at the level of ecosystems**, in the context of climate change and globalization and address 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 planned in the Strategic Plan 2021-2024, but not yet addressed in the first work programme. This was the case for instance for several direct drivers of biodiversity loss. The new drafting of the impacts makes clear that they are in the scope of the work programme.

Heading 1 – Understanding and addressing the main drivers of biodiversity loss

Proposals are invited against the following topic(s):

HORIZON-CL6-202X-BIODIV: Invasive alien species

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, projects will contribute to understand and address direct **drivers of biodiversity decline**.

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

- Minimisation of the establishment and where possible elimination of alien species incidentally introduced in the EU environment,
- Early warning systems to inform relevant stakeholders of the introduction of invasive alien species,
- Effective prevention from the introduction of invasive alien species and systemic management of established ones,
- Public awareness on invasive alien species.
- Decrease by 50% the number of Red List species threatened by invasive alien species (commitment of the EU Biodiversity strategy 2030).

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 release 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.

Projects should:

- Develop models based on dynamic data, accessible to end users, to manage pathways of the unintentional 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, etc.), DNA barcoding, artificial intelligence, sentinel plants in ports, airports, railway stations, and logistics platforms.

Proposals should build on on-going projects supported under H2020

HORIZON-CL6-202X-BIODIV: Plant pollinator networks and cascading effects in ecosystems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the EU pollinators initiative and the EU 2030 climate pact projects will contribute to understand and address direct **drivers of biodiversity decline**, including in the context of climate change.

Project results are expected to contribute to the following expected outcome:

- Better understanding of animal pollination ecology in order to preserve this ecosystem function and service particularly in the context of climate change.

Scope:

This topic should address knowledge gaps on what pollinates what, how much, where and when in particular with regard to wild plants. Projects should:

- Investigate the structure and functionality of pollination networks (plant-pollinator networks), covering both wild plants and crops;
- Investigate the full spectrum of animals that pollinate plants in Europe, going beyond the well-known insects (bees, hoverflies, butterflies, moths);
- Develop a European plant-pollinator database; provide geospatial dimension of pollination networks and develop an atlas of pollinators and pollination service;
- Map areas vulnerable to climate change with regard to pollination capacity;
- Assess impacts of pollinator decline on wild plants, ecosystem functions they provide, and potential cascading effects in ecosystems, taking into account various climate change scenarios.

HORIZON-CL6-202X-BIODIV: Chemical pollution and biodiversity

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the zero pollution action plan and the EU pollinators initiative, projects will contribute to understand and address direct **drivers of biodiversity decline**.

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

- Improved knowledge on routes of exposure of nature, including flora and fauna, to chemicals,
- Improved knowledge of existing contaminations (legacy) and accumulations in nature,
- Better understanding of toxicological and ecological impacts and strengthened risk assessments.

Scope:

- The topic intends to address chemical pollution issues on terrestrial biodiversity including on pollinators. Two projects among four will be dedicated to pollinators.
- Projects should assess the effects and impacts of chemical pollution in particular the most hazardous substances and elaborate prevention and mitigation measures. A priority is put on the contamination of the environment with chemical pesticides and their metabolites, pharmaceuticals (hormones and antibiotics) and veterinary products but does not exclude other chemicals.
- The projects on pollinators should improve knowledge and tools to strengthen risk assessment of pesticides on pollinators and will improve prediction of the toxicity endpoints, develop toxicokinetic and toxicodynamic data and models (for single and multiple chemicals), investigate synergist effects of typical pesticide combination, generate combined toxicity data (lethal and sublethal effects) of multiple chemicals, develop databases on exposure and hazard assessment, develop population models and landscape modelling, and develop environmental scenarios.

HORIZON-CL6-202X-BIODIV: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	CSA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, projects will contribute to understand and address direct **drivers of biodiversity decline**.

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

- Identification of the main noise and light sources involved in biodiversity loss and better understanding of their impacts and their magnitude.
- Better understanding of the combined effects with other drivers of biodiversity loss.
- Identification of the main knowledge gaps and needs for further R&I activities.
- Identify EU policies dealing with noise and light and biodiversity.

Scope:

The objective of this topic is to take stock of current knowledge on the impacts of noise and light on biodiversity, mechanisms involved and possible combined effects and to develop networking.

The topic could possibly cover the effects of electro-magnetic waves.

HORIZON-CL6-2023-BIODIV: Interdisciplinary Assessment of Ecosystems Change, Vulnerability and Response to Natural and Anthropogenic Pressures in Terrestrial and Freshwater Ecosystems building on Earth and Environmental Observation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of XX EUR 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 XX EUR million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome: These joint activities will foster a collective effort in Europe to assess the status of European and global terrestrial and freshwater ecosystems and prioritise conservation and restoration actions of these ecosystems with a special focus on the use of the wealth of Earth and Observation data available.

Project results are expected to contribute to all following outcomes:

- Improved understanding of the status of and threats to key terrestrial and freshwater ecosystems, of the integrity of these ecosystems and their resilience to multiple stressors
- Improved and extensive collection of integrated ground observations of ecosystems and ecosystem functioning under stress
- Enhanced science base supporting the post-2020 global biodiversity framework of the Convention on Biological Diversity (CBD) regarding terrestrial and freshwater ecosystems.
- Enhanced understanding of the adverse impacts of climate change on biodiversity and ecosystem functioning.
- Better prioritisation, design and monitoring of terrestrial and freshwater ecosystem conservation and restoration actions.

Scope:

- Use the enhanced Earth Observation capacity in Europe and in International Programmes together with other relevant sources of data to better understand the ecological processes of terrestrial and freshwater ecosystems
- Assess the status and dynamics of these ecosystems, estimate their vulnerability to multiple stressors including anthropogenic and natural pressures, 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).

- Extensive use of ground based (and airborne based) in-situ observation using novel observing system and citizen science for assessing the impact of the main natural and anthropogenic pressures on the ecological processes of natural ecosystems and on their functioning (i.e., addressing individual and cumulative effects of multiple stressors).
- Improving modelling of ecological processes in a changing climate that leads to ecosystem degradation (i.e., degraded, damaged and destroyed ecosystems)
- Monitoring the status of natural ecosystems and assess the changes in relation to the underlying ecological processes.

This topic is part of a coordination initiative between ESA and the EC on Earth System Science. The ESA-EC 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 Future EO programme

Heading 2 – Biodiversity protection and restoration

Proposals are invited against the following topic(s):

HORIZON-CL6-202X-BIODIV: Digital for nature

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA or IA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030 and the EU climate pact 2030, projects will contribute to plan, manage and expand **protected areas** based on up-to-date knowledge and solutions, to understand and address direct **drivers of biodiversity decline** and to deliver and upscale **Nature-based Solutions**.

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

- Better understanding of the drivers of biodiversity loss and of the state of conservation of nature thanks to better exploitation of existing data,

- Better monitoring of biodiversity in the EU, leading to better implementation of the nature directives.
- Nature-based Solutions are fit for purpose, have higher performance and are upscaled, thus contributing to facing the climate and biodiversity crises and other societal challenges.

Scope: There are large amounts of existing data from research or official monitoring and reporting under the Birds and Habitats Directive that are not sufficiently accessible, linked and exploited. Technical solutions need to be found to better use and exchange this data.

The project aims to develop digital solutions, based on data mining software and artificial intelligence including deep learning. This should be employed to analyse all publicly available data in relation to habitats and species. Such digital solutions could support the setting of conservation objectives and of effective conservation measures and management plans. They could also help to forecast the expected impact of conservation and restorations measures at site, regional, national or biogeographical level. Furthermore, the results could be used during formal monitoring and reporting obligations. In order to mine all available data, the systems have to be able to analyse information with all EU languages and in different formats. In order to increase effectiveness and efficiency of biodiversity monitoring, software to automatically detect species on pictures made by automatic cameras or on audio recordings should also be developed. In addition, there are untapped opportunities for the development of digital tools to enhance the performance of Nature-based Solutions (e.g decision support tools, mapping and geomatics approaches, remote and proximal sensing applications, citizen science tools, etc).

Projects should:

- Map existing databases for biodiversity data in the EU and explore on their availability,
- Ensure interoperability of available data, enabling EU-scale information systems,
- Develop cost-effective and easy-to use analytical tools and software to analyse different existing data sources and formats (in vivo data, photographs, sound recordings, DNA, satellite images etc.). In order to facilitate cost-effective data analysis, map and link existing databases and provide algorithms to better analyse them.
- Develop guidance from academics for practitioners on how to best use existing databases as well as new data collection and analytical tools.
- Develop a solution to search and analyse all publicly available data in relation to protected habitats and species (including protected sites management information, their conservation objectives and measures, and restoration actions).
- Develop improved, user-friendly and cost-efficient camera traps and sound recorders in order to be used on land and in the sea, in order to improve data collection. These should be tested in at least 10 demonstration projects in order to collect data on EU-protected species listed under the Birds- and Habitats Directive.

- Develop, improve, tailor and expand the use of artificial intelligence in biodiversity research and monitoring in Europe, such as software to automatically detect species on pictures made by automatic cameras or on audio recordings.
- Develop a digital platform incorporating automatic translation to better connect EU Member States, associated countries and accession countries to support them in the implementation of EU nature legislation, such as the Birds and Habitats Directive or the Marine Strategic Framework Directive.
- Develop digital tools to support the selection, co-creation, co-implementation, maintenance and monitoring of Nature-based Solutions.
- 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 etc.

Projects should link to other relevant Horizon 2020 and Horizon Europe projects, such as EuropaBON, the European Partnership rescuing biodiversity to safeguard life on Earth (HORIZON-CL6-2021-BIODIV-02-01) and projects under the topic HORIZON-CL6-2021-BIODIV-01-07: Ecosystems and their services for an evidence based policy and decision-making. 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.

HORIZON-CL6-202X-BIODIV: Nature protection

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA or IA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the nature restoration law and the birds and habitats directives, projects will contribute to plan, manage and expand **protected areas** based on up-to-date knowledge and solutions.

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

- Better knowledge to support the improvement of favourable conservation status for species and habitats laid down in the EU Birds and Habitats Directives, and better knowledge on what is needed to achieve favourable conservation status of habitats and species covered by EU nature legislation (e.g. the definition of favourable reference values).
- 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:

Projects should:

- Improving the detailed definition of “favourable conservation status” of habitats and species protected under the EU Birds and Habitats Directives by establishing favourable reference values, by improve the monitoring of habitats and species and by making best possible use of existing data and tools to map habitat types and habitats of species as well as their condition. This work should focus on data-deficient habitats and species, on habitats and species in the worst status (conservation status and/or EU Red list status), those with declining trends as well as on species the recovery of which has created tensions with certain stakeholders (e.g. large carnivores, cormorants, etc.).
- With a view to ensure the recovery of habitats and species in unfavourable conservation status according to the most recent reporting under the EU Birds and Habitats Directive (2019), define restoration needs in terms of geographical location, quantity and quality of habitat to be restored.
- Identify habitat management and restoration needs for huntable bird species, with a focus on agricultural habitats, explore 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.

HORIZON-CL6-202X-BIODIV: Understanding and reducing bycatch of protected species

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the Birds, Habitats and Marine Strategy Framework Directives, and the common fisheries policy, as well as the upcoming “Action plan to conserve fisheries resources and protect marine ecosystems”, projects will contribute to improving the monitoring and assessment of the impact of bycatch in fishing gear on protected species, defining and implementing effective mitigation and management tools, based on up-to-date knowledge and solutions to understand and address direct drivers of biodiversity loss.

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

- Elimination or significant reduction of bycatch is achieved for marine mammals (e.g. currently 10 000 dolphins killed each year in the Bay of Biscay), sea turtles (currently 70 000 killed each year in EU waters) and sea birds (currently 200 000 killed each year in EU waters).
- Bycatch risks and reasons are well understood as the basis for improving Member States’ monitoring programmes and implementing management actions. Bycatch risk maps are established for all seas and all relevant species/gears interactions..
- Bycatch mitigation tools are improved, in particular innovative mitigation devices or spatial measures, to be implemented by Member States to reach the target of the Biodiversity strategy to eliminate or reduce bycatch of sensitive species.

Scope:

For all regional seas, projects should:

- Evaluate bycatch risk on a sea basin and/or local level (in particular for cetaceans, sea turtles and seabirds) by comparing the fishing activity of high risk gear and distribution/abundance of affected species, producing bycatch risk maps.
- Develop/improve tools for monitoring of bycatch, including long-term observation and surveying programmes, in particular through extending the use of remote electronic monitoring and artificial intelligence-based image recognition, to understand the magnitude of the problem and to help Member States identify and implement adequate conservation measures as required by EU legislation.
- Close the knowledge gaps on the precise extent (number of individuals, season and locations) and reasons of bycatch (relevant métiers), focusing on species threatened by extinction or in bad status.

- Assess the effectiveness of existing mitigation methods and address their shortcomings, including through the development and testing of new approaches.
- Develop targeted communication strategies for relevant stakeholders and fishing authorities to raise awareness and commitment for them to participate in the research projects.
- Contribute to coherent implementation of EU environmental and fisheries legislation and the upcoming Action plan to conserve fisheries resources and protect marine ecosystems.
- Projects should build on previous relevant projects, the work of H2020 and LIFE projects and Horizon Europe projects on cumulative impact of stressors (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 (HORIZON-CL6-2022-BIODIV-01-01: Observing and mapping biodiversity and ecosystems, with particular focus on coastal and marine ecosystems), as well as relevant work done by ICES and in Member States.

HORIZON-CL6-2024-BIODIV: Restoration of deep-sea habitats

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	XX The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the nature restoration law 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 will 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 and definition of ecosystem functioning restoration targets, considering short to long timescale and taking into account impact of climate and other abiotic changes.
- Better decision making and blueprints for the financing and the selection of tested active restoration approaches, tools and monitoring of their effects taking into account costs benefits analysis integrating ecosystem services and natural capital accounting.
- Advance in knowledge on deep-sea ecosystems adaptation and of restoration as nature based solution for adaptation and possible climate 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 biogenic habitats 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.

- Projects should build on and capitalise on the knowledge base developed and lessons learnt from the H2020 MERCES project and its work on deep-sea restoration, as well as from other EU relevant past or ongoing projects in the field of deep-sea ecosystems exploration from H2020 and Horizon Europe (notably in topic HORIZON-CL6-2021-BIODIV-01-03).
- 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.
- Integration of 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.
- Focus not only on species traits but also on ecosystem functionalities including adaptation potential. Include abiotic changes due to climate impact scenarios in identifying niche and refuge niche.
- Require involving local communities, including the fishing sector, for the recovery of biogenic species in fishing nets. Develop ownership and business cases in establishing restoration targets and actions for effect that will be visible in a long-term.
- Advancing the knowledge base on the costs and benefits of deep-sea restoration: Socio-economic importance of deep-sea ecosystems; upscaling issues, costs and timescales considerations ; gaps in assessing and valuing changes in ecosystem goods and services ; natural capital accounting.

HORIZON-CL6-2024-BIODIV: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome: In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, the nature restoration law 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 will provide public authorities, as well as related infrastructures operators in their design, engineering, construction, installation and exploitation, with nature centred solutions beneficial for biodiversity, ecosystem services and the original infrastructure purpose (renewable energy production, aquaculture, recreation, coastal erosion protection, maritime transport, etc.).

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 coasts and urban areas from climate change impacts, offshore windfarms, harbours, tourism development, bridges etc.) are intentionally designed and actively used to support the restoration of marine ecosystem health and services (including climate mitigation & adaptation).
- Up scalable Blueprints integrating the conception, installation, exploitation, maintenance of hybrid blue-grey infrastructures that are beneficial to ecosystem functioning and restoration.
- Mainstreaming biodiversity in marine and coastal infrastructures and activities.

Scope:

- Large scale demonstration of hybrid nature-based solutions with built coastal and marine infrastructures to support ecosystem restoration for at least two infrastructure purposes (e.g. coastal or urban protection from climate change impacts - SLR, extreme

events, erosion, renewable energy, maritime services and safety, recreation, aquaculture, tourism development, bridges etc.) with the highest upscaling and impact potential.

- Looking at infrastructures serving several purposes is encouraged. In any cases proposals should integrate the relevant results of projects on multi-use of the marine space of Horizon 2020.
- Address selection or development of materials for the infrastructures, their design, installation, and maintenance to maximise the positive effect on the protection or restoration of marine ecosystems and their socio-ecological management.
- Explore and improve co-creative approaches related to the restoration of ecosystems involving built infrastructures
- Provide evidence and data of the multiple benefits and potential trade-offs of these hybrid solutions at short and long-term scale and in particular to the purpose of conserving and protecting biodiversity, but also on the economy and society.

Heading 3 – Mainstreaming biodiversity in society and the economy

Proposals are invited against the following topic(s):

HORIZON-CL6-202X-BIODIV: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 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:

- Better understanding of how our society and the economy depend on pollinators, and advance valuation of ecosystem services provided by pollinators.

Scope:

Projects should:

- Assess dependency of biomass supply chains on pollinators and develop tools for businesses to assess their dependence on pollinators,
- Investigate the dependency of sustainable nutrition on pollinators and potential risks due to their decline;
- Advance quantitative and qualitative valuation of the societal benefits of pollinators, animal pollination, and other ecosystem services that pollinators provide or support indirectly;
- Assess impacts of pollinator decline on the society and undertake scenario forecasting towards 2050 in the case of an unmitigated pollinator decline.

HORIZON-CL6-2023-BIODIV: Improving higher education governance and skills development for biodiversity and Nature-based Solutions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	XX

Expected outcome: The 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 2021 a Council Recommendation on encouraging cooperation in education for environmental sustainability, including biodiversity learning and teaching.

This topic aims to contribute to education, skills development and awareness raising about biodiversity and Nature-based Solutions in universities and technical schools. This is

fundamental to further implement and upscale NBS, develop a nature-based economy and to contribute to transformative change through education, notably contributing to the EU Biodiversity Strategy for 2030 and the EU Climate Adaptation Strategy.

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

- Improved and more coordinated education programmes and increased awareness about biodiversity and Nature-based Solutions (NBS), in universities and technical schools.
- Increased awareness among young people, teachers, young professionals, authorities and decision makers on biodiversity and the promotion of NBS.
- A sustainable recovery of society and the necessary transformative change through biodiversity-friendly actions, professional, collective and personal attitudes.
- A transdisciplinary dialogue is established on inclusive NBS, nature-based economies, and nature-based thinking, drawing on inclusiveness, the pluralities of values and knowledges.

Scope:

- Develop NBS networking and collaboration schemes on higher education curricula and programmes (e.g. masters degrees and PhD), as well as researcher mobility and participation in NBS living labs and other research infrastructure. Support and promote the teaching of NBS co-design and co-creation as part of degrees and further education qualifications;
- Develop NBS capacity building and skills development programmes, knowledge transfer mechanisms, in coordination with the relevant professional organizations and the work developed on NBS standards and protocols;
- In view of a just ecological transition, provide specific skills development programmes for the youth, long-term unemployed or other social groups in need (including in most deprived regions);
- Provide a dialogue space ensuring transdisciplinarity and welcoming the pluralities of values and knowledges, on biodiversity and NBS in view of transformative change to tackle both climate and biodiversity crises.
- Outreach and cooperation activities between higher education institutions or technical schools with citizens, the local and regional communities, industry, research centres, or museums, supporting challenge-based and experiential learning with real-life applications, promoting public debate and a change of behaviour.

HORIZON-CL6-2024-BIODIV: Demonstrating Nature-based Solutions for the sustainable management of water resources in a changing climate, to reduce the impacts of droughts

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome: Due to the changing climate, many European regions are already facing more frequent, severe, and longer lasting droughts. By deploying systemic thinking, Nature-based Solutions (NBS) utilise an understanding of the structure and functioning of local ecosystems over time to address a broad range of societal challenges, including water management. 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.

However, evidence on these measures remains disperse and incomplete and appears often associated to actions addressing flood risk. 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 effects of different designs and combinations of NBS, operating in different contexts (urban, peri-urban and rural) and at different scales in what regards the sustainable management of water resources to reduce the impacts of droughts.

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

- Consolidated evidence of the contribution of NBS to sustainable water management, notably concerning the reduction of impacts of droughts, in accordance with the Water Framework Directive objectives and the Floods Directive;
- Innovative cost-effective NBS approaches, designs, technologies and materials for integrated water management are more widely available and upscaled;
- Consolidated business cases for NBS for water management and enhanced market demand for these solutions;

- Enhanced implementation of EU policies for water management (Water Framework Directive, Floods Directive, Blueprint to safeguard Europe's water resources), the EU Strategy for Climate Change Adaptation, the Biodiversity Strategy for 2030 and the EU Soils Strategy for 2030; Contribution to Horizon missions "A Soil Deal for Europe", "Restore our Oceans and Waters by 2030" and "Adaptation to Climate Change".

Scope:

- Demonstrate innovative, systemic and locally attuned NBS, for the management of water resources and the reduction of drought risks, in areas that are heavily impacted by water scarcity and areas that are being increasingly exposed to this risk with the deepening of climate change, and at the appropriate scales.
- Develop an advanced monitoring programme and assess the economic, social and ecological benefits and trade-offs of NBS;
- Identify and assess barriers related to the social and cultural acceptance of NBS and policy regulatory frameworks and propose ways to overcome them;
- Develop methodologies, tools and best practices enabling the replication and up-scaling of NBS in different contexts, including innovative investment strategies, governance and business models, as well as performance assessment tools, protocols and standards for the design, operation and maintenance of these solutions;
- Understand and mitigate functional conflicts in land-use for better and more integration between NBS, land-use planning and other (possibly conflicting) sectors, their policies and planning processes;

HORIZON-CL6-2023-BIODIV: Biodiversity, economics and finance

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

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, while avoiding macro-financial risks associated with it, 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 the following expected outcomes:

- New knowledge to accelerate the ecological transition and structural economic change towards nature-positive economy and macroeconomic and financial stability across EU, in a context of erosion of natural capital and of degradation of ecosystems and their essential services
- Better awareness, knowledge and know-how of key economic actors and institutions, public and private, providing them with the approaches and tools for **integrating biodiversity, ecosystem services and natural capital in their decision making**
- Better mobilisation of capital to slow down and reverse biodiversity loss in the broader context of environmentally sustainable development; e Ramping up investments in natural capital and nature positive projects andr solutions benefiting both climate and biodiversity, such as nature-based solutions
- Better understanding of the opportunities and barriers (knowledge gaps, skills gaps, etc.) associated with the implementation of the **Sustainable Finance Taxonomy**⁶
- Better Measurement, monitoring and management of biodiversity.

The project should improve scientific understanding in only one of the following areas:

- a. Bring a better understanding of the **financial risks of biodiversity loss**, in particular at a macroeconomic scale, by the **investors, companies and financial market participants**, including central banks and financial supervisors, and of possible response options,
- b. Creating knowledge and guidance for reorienting financial flows towards activities that benefit the protection and restoration of biodiversity and ecosystems, in supporting the stakeholders in the implementation of the EU Sustainable Finance taxonomy.

Scope:

⁶ Delegated Acts[1] of the correlated Regulation (EU) 2020/852, including the technical screening criteria of ‘Substantially Contribute’ (SC)[2] and ‘Does Not Substantially Harm’ (DNSH) in regards of the protection and restoration of biodiversity and ecosystems[3]

As more than half of the world's GDP relies on nature, it is estimated that the risks posed by ecosystem degradation to human societies could be at least as high as those imposed by climate change.

The successful proposals should for both areas:

- Provide Investment fund managers (“IFMs”) with tools, guidance and methodologies to gather reliable, consistent and standardised data and enable to incorporation into their investment decision and risk management processes;
- Integrate state-of-art scientific evidence on biodiversity and its loss into existing models and analytical frameworks in mainstream environmental economics and financial risk assessment methods
- Integrate end-users and stakeholders (non-financial corporations, financial institutions, governments etc.). to fully account for their respective views and needs ;
- Identify potential skill gaps and propose a capacity building strategy to tackle these skills shortage;
- Issue recommendations at EU as well as other levels on enabling conditions for biodiversity-focused sustainable finance principles, exploring synergies with other EU initiatives, such as the Non-Financial Reporting Directive (NFRD)[1] and the Corporate Sustainability Reporting Directive[2].
- Appropriate budget and tasks should be provisioned in the proposal for developing common activities with the other projects of the topic.

For area A, the projects should:

- investigate various possible risk/shock categories, their transmission channels and cascading effects, as well as adaptive capacity of economic and financial agents/institutions, considering various time (short/medium/long-term) and spatial scales (global, EU and Member State level);
- extend the analysis to worst-case scenarios, and the effects of low-probability but high-impact biodiversity-related tail risks;
- develop biodiversity-related **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 a more comprehensive and more robust environmental risk management in the financial sector, developing innovative methodologies and tools to support risk assessment that can better capture the specificities of nature and ecosystems, and considering in particular **macro-financial risks**, including both physical and transition ones;

- co-create tools to **assess the alignment of corporates and financial institutions** with international biodiversity-related goals;
- explore 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.

For area B, the projects should:

- Engage in the analysis and the solutions the relevant stakeholders from the financial community, including academics, regulatory bodies involved in the implementation of the regulations and civil society and NGOs having developed relevant standards and protocols;
- Identify and analyse 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; explore further criteria/sectors through case studies;
- Analyse the investment landscape in relation to protection and restoration of biodiversity and ecosystems, identify best practices and evaluate the leverage potential of the EU Taxonomy and its key success factors;
- Provide guidance on the interpretation of the technical screening criteria for determining whether an economic activity substantially contribute (SC) to one or more objectives, as set in the Regulations. It should also guide on the interpretation of the technical screening criteria for determining whether an economic activity causes significant harm (DNSH) to the protection and restoration of biodiversity and ecosystems, as set in the Regulations.

HORIZON-CL6-2023-BIODIV: Build up the knowledge on “Nature- Based Economy” (NBE) and support its emergence and usage in the current economic approaches

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome:

In line with the European Green Deal priorities and in particular with the EU Biodiversity Strategy for 2030 and the 2030 climate targets, the successful proposal will support the development of policies, business models and market conditions to scale up and speed up the implementation of Nature-based Solutions (NBS) and of nature positive economic activities; and mainstream biodiversity, ecosystem services and natural capital in the society and economy. It will contribute to the wider deployment of NBS and to fully reaping their economic, employment, social and environmental benefits in order to build a competitive sustainability in Europe and to tackle climate change.

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

- Further promoting the development and use of harmonized natural capital accounting as called for by the EU 2030 Biodiversity Strategy and the 2021 Sustainable Finance Strategy and the relevant EU funded projects (LIFE Transparent project and relevant Horizon 2020 projects)
- The creation of an EU community of ‘Nature-based enterprises’ and increased private sector uptake of nature positive activities (economic activities substantially contributing to the protection of biodiversity and ecosystem services), with EU as global leader
- Increased knowledge and expertise of relevant stakeholders in public and private sectors on the opportunities of an emerging economy which benefits nature and addresses societal challenges notably climate change, with NBS at its core, and on how to value nature
- Better integration of innovative nature-based entrepreneurship and nature-based economy in the current economic and financial system, with increased awareness among economic and financial decision makers of the importance of the emergence of NBE and the natural capital accounting applications
- Better implementation of the EU biodiversity strategy for 2030, the new EU Climate Adaptation Strategy and of EU Green Deal priorities and Increased collaboration with other key policy areas e.g. Regional policy, Enterprise policy, Agricultural policy as well as with bioeconomy (bio-based economy) and circular economy approaches

Scope:

The successful proposal should:

- Identify the European and national market barriers and potential in different economic sectors, including modelling of job creation potential, and for each sector, identify the complexity of stakeholder value chains in the promotion of a ‘Nature-based economy’ and the delivery of different types of NBS and “nature positive” products and services
- Analyse how NBS can be integrated into bioeconomy/circular economy approaches and identify the benefits and trade-offs of combining both, and at what scale such approaches work best;
- Put in place collaborative and participatory arrangements and spaces between entrepreneurs of NBS and more generally of a nature-positive economy

- Propose innovative solutions, including economic and governance innovations, as well as actions and policy recommendations for the development of both NBS supply and demand and of nature positive activities and for closing the science-practice-policy gap
- Explore the different approaches to the valuation (monetary and non-monetary) of nature within the context of an Economy which will not only **reduce dependencies to nature but have positive benefits for biodiversity**
- Support the engagement of the community in the development of more comprehensive **industry-led standards** for different types of NBS to support and promote Nature-based economy, which is delivering such **nature positive outputs, and using nature as an input.**
- Network with similar actions from Member States/associated Countries
- This topic should involve the effective contribution of SSH disciplines.

HORIZON-CL6-2023-BIODIV: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome:

In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030 and the nature restoration law, 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:

- Better implementation and delivery of the **EU Biodiversity Strategy for 2030** and more particularly, the Urban Greening Plan **toolkit** and guidance are consolidated, with resources and guidance available to support the implementation of each step of an **Urban and Peri-urban Greening Plan**;
- Increased capacity and skills in cities to work ‘at the right scale’ for the challenge considered and in cross-cutting manner across policies, measures, strategies – including

spatial planning capacity, so as to help deliver **urban greening plans, green infrastructure** strategies and more widely transformative change towards sustainable cities, with local and green jobs;

- Better understanding on how and under which conditions spatial planning can help to **optimise the ecosystem services of the solutions, strategies and actions, such as ecosystem restoration/creation, NBS, blue and green infrastructure**, when addressing social equity and spatial justice aspects; particularly understand how to optimise the combination of solutions for different policies mix and at different scales
- Better integration of nature-based objectives in **investments in infrastructure and other urban systems**;
- Better **investment cases** for renaturing the urban and peri-urban areas and fund and maintain NBS in the long-term, thanks to innovative governance and finance models;
- Better understanding on how to manage the tension between nature and biodiversity protection and urban development pressure, at what scale and in which timeframe – considering the long-term cycle of spatial planning strategies, which can lead to ‘outdated’ urban development regulations vis a vis current challenges or expectations

Scope

The successful proposal should:

- **Perform a stocktaking** of the state the existing ecosystems and their services and the co-identification of direct (urban development pressure etc.) and of the indirect drivers of biodiversity and ecosystem services loss at local level (policy, spatial regulations, financial incentives, land management practices, etc.) should be the basis for the development of pathways (Baseline assessment);
- **Develop** a replicable methodology for cities and urban areas across Europe to co-design pathways, a shared long-term vision and an integrated strategy with policies and action plan (e.g. with responsibilities, timeline and financing) towards **the urban ecosystem restoration targets such as formulated in the future EU Restoration Law** and towards the protection, restoration and enhancement of urban and peri-urban ecosystems;
- Include in the methodology the necessary mapping and assessment methods, economic and co-creation governance models to co-develop and prioritise i. **cost effective and efficient solutions**, ii. **Innovative solutions and governance models** iii. **innovative financing and business models**
- **Co-develop and test the methodology** in a representative sample of cities across EU and with local stakeholders from all whole society that will enable the **uptake of the models and tools developed across EU and EU regions**

- **Engage** in the testing cities the different departments of the local authorities, local research and technical organisations, big urban/ land managers or users, citizen, including vulnerable groups, SMEs such as nature-based enterprises, etc.

HORIZON-CL6-2024-BIODIV: Impact of digital transformation, and delivery of governance tools and policy mixes for transformative action on biodiversity

To be confirmed pending analysis of why the topic which was in year 2021 of work programme 2021/2022 did not attract proposals of sufficient quality. If kept, the topic would be adjusted according to the results of the analysis.

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

Expected outcome: In line with the EU biodiversity strategy, successful proposals will develop:

- (i) knowledge and understanding of the transformative changes needed to address the indirect drivers of biodiversity loss underpinned by societal values and behaviours, and
- (ii) improved and innovative governance tools and policy mixes that can effectively initiate, accelerate and upscale such biodiversity-relevant transformative changes in our society.
- (iii) help understanding the impacts of and the opportunities offered by digital transformation, new emerging technologies and social innovation on biodiversity.

Projects should address all following outcomes:

- Operational knowledge available to, and used by policy-makers, 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 smart technologies, artificial intelligence, automation, miniaturised sensors, citizen science applications, crowdsourcing), new materials (e.g. for biomimicry), and new and emerging technologies.
- Identification and an 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, ‘exnovation’), also by empowering and endowing communities.

Scope:

- Policy mixes, governance and decision-making tools to achieve the necessary ecological, climate, economic and social transition for biodiversity are not yet widely available, and must be developed.
- 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 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, which could feed into the just transition process and inform and inspire transformative change through learning, co-creation and dialogue.
- 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 develop methodologies to assess their impacts (including the impacts from energy/electricity infrastructure, or 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.

HORIZON-CL6-2023-BIODIV: Contribution to the reinforcement of science policy support to better interconnected biodiversity and climate policies

To be confirmed pending analysis of why the topic which was in year 2021 of work programme 2021/2022 did not attract proposals of sufficient quality. If kept, the topic would be adjusted according to the results of the analysis.

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply: Due to the scope of this topic, legal entities established in all member states of the African Union are exceptionally eligible for Union funding

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 policies. This will require the contribution to processes triggered by the EU and global Knowledge Centres for Biodiversity, 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 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 knowledge centres for biodiversity and 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 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 researchers play their role by contributing to EU and global regular assessments (EU ecosystem assessment, IPBES global assessments, Gap and Stocktake Reports, global biodiversity outlook) and 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 the following points:

- a. providing assistance to the EU and associated countries, for reinforcing the input into the EU and global Knowledge centres, IPBES and IPCC on biodiversity;
- b. 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 EU languages;

- c. networking and facilitating synergies through cooperation between IPBES, IPCC and amongst researchers and relevant scientific bodies of other regional Multilateral Environment Agreements;
- d. proposing standards for EU-funded biodiversity projects to apply the relevant outcomes of the IPBES data and knowledge task force;
- e. 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

Heading 4 – Biodiversity friendly practices in agriculture, forestry and aquaculture

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-BIODIV: Conservation and use of genetic diversity for sustainable agriculture: focus on crop wild relatives

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Crop Wild Relatives (CWR) are a key asset for sustainable agriculture. Yet, their preservation and use are lagging behind as compared to main crops. Activities under this topic will help to take stock of the wealth of CWR and promote their status in ex-situ and in-situ conservation as well as their use in breeding and farming. This topic addresses a major need raised by the genetic resources community. It will support the aims of the upcoming international post 2020 biodiversity framework.

HORIZON-CL6-2023-BIODIV: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi actor approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: This topic will support the implementation of the Green Deal, the biodiversity strategy, the farm to fork strategy and the Common Agricultural Policy.

This topic will benefit both conventional and organic farming.

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

- Greater knowledge of relevant traits for resistance and/or tolerance (resilience) to biotic stress;
- Improve access to a wider pool of seeds, varieties and cultivars with resistant characteristics;
- Improve testing methodologies for sustainability characteristics of new varieties;
- Promote breeding for IPM including local adaptation (i.e. terroir effects, local disease pressures, positive interactions with biological control) and intra-/inter-specific mixtures or other alternative cultivation practices (i.e. intercropping);

Scope: Breeding for integrated pest management (IPM) aims for boosting the development of cultivars with tolerance or resistance to key and emerging pests, adaptable to local conditions, with the goal of reducing reliance on chemical pesticides.

Proposals should:

- Contribute to a better understanding of crop-specific genetic characteristics underpinning tolerance to pest pressure;
- Increase the knowledge on the interaction between plants/environments/pests;
- Identify and introduce resistance traits to develop varieties/cultivars adaptable to local conditions;
- Promote the deployment of variety/cultivar resistance in combination with the range of tools available for integrated pest managements/organic farming such as crop diversification, biological control agents (e.g., micro-organisms), the preservation and

enhancement of natural enemies of pests (e.g., beneficial insects/mites/nematodes), etc.

- Contribute to the use of resistant, partially resistant or tolerant varieties/cultivars for integrated pest management.
- Support capacity building, training and education enabling farmers/growers to adopt sustainable agricultural practices in pest management following the integration of these new tolerant varieties/cultivars.

HORIZON-CL6-202X-BIODIV: Promoting pollinator friendly farming systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi actor approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

This topic supports the implementation of the Green Deal, the biodiversity strategy, the farm to fork strategy and the Common Agricultural Policy.

This topic will benefit both conventional and organic farming.

Expected outcome:

- Farmer systems are more pollinator-friendly and support (agro)biodiversity
- Development of pollinator-friendly cultivars, rotations and combination of crops

Scope:

Proposals should:

- Increase the understanding of the crop-farming system-pollinator relationship;
- Identify crop traits that enhance crop-pollinator interactions;
- Contribute to the development of pollinator-friendly varieties;

- Develop strategies and testing farming systems that take into consideration temporal and spatial diversification of crops to match pollinators needs;
- Promote and facilitate the uptake of farm-pollinator friendly practices
- Promote the reintroduction of landscape features in intensive agricultural areas

HORIZON-CL6-2024-BIODIV: Promoting minor crops in farming systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi Actor Approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected Outcome:

This topic supports the implementation of the Green Deal, the Biodiversity Strategy, the Farm to Fork strategy and the Common Agricultural Policy.

This topic will benefit both conventional and organic farming.

Successful proposals will contribute to the following outcomes:

- Farmers make use of a wider range of crops and combination of crops
- Increased resilience of farming systems vis-a-vis biotic and abiotic stresses
- Creation of new avenues for farmers and value chains through a wider range of products
- Integrated minor crops in farming systems promoting its environmental benefits.
- Increased evidence of the environmental benefits of minor crops

Scope:

- Promote access and use of minor crops (breeding and management)
- Improve agronomic management practices for minor crops

- Demonstrate the ecosystems services supported through diversification and minor crops
- Explore the benefits of minor crops

HORIZON-CL6-2024-BIODIV: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: In supporting the implementation of the Green Deal, the EU 2030 biodiversity strategy in particular the target of 10 % of agricultural area back under high-diversity landscape features, the farm to fork strategy and the common agricultural policy successful proposals must address the following outcomes:

1. Better identification of drivers and challenges for the re-introduction of landscape features in intensive farming areas,
2. Building strategies to reintroduce landscape features in intensive agricultural areas. Identification of possible pathways towards more diversified business models involving nature. Analyse their economic viability.
3. Prepare the ground for possible future demonstration projects

Scope:

The EU biodiversity strategy 2030 provides that 10% of agricultural area should be brought back under high-diversity landscape features to provide space for wild animals, plants, pollinators and natural pest regulators. These include, 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 helps lead to more agricultural production.

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. In particular it is needed to achieve ecological corridors, in conjunction with other multifunctional Nature-based Solutions. However, for the reintroduction of landscape features in such areas to happen, there is a need to convince land owners/managers to do so. Proposals should therefore analyse what could give an impulse to move towards the reintroduction of landscape features in such areas.

Proposals should:

- Economic aspects: investigate into possible business models which can combine the reintroduction of landscape features with rewarding economic activities including possibly recreational ones. This could possibly build on positive experiences with agro-forestry.
- Social and behavioural aspects: who takes the decision in which context (private ownership of land)? Behavioural aspects? Generational impact? Social acceptance? Does the intrinsic value of biodiversity play a role?
- What could be the right incentive(s) (beyond financial incentives) to lead to change?
- Topic with high relevance of SSH

HORIZON-CL6-2024-BIODIV: Maximising the synergies and minimising of trade-offs in the conservation and protection of endangered carbon-rich and biodiversity-rich forest ecosystems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcome: In line with the EU biodiversity and climate change objectives, successful proposals will support the protection of biodiversity-rich forest ecosystems, at the species' distribution edges, that are at a high risk 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 on forest-based adaptation and mitigation; 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 and development and implementation of ecosystem protection and restoration methods and tools for resilient, carbon rich and biodiversity supportive forests.
- Better understanding of the potential and barriers for natural co-migration of forest communities and development of approaches and guidelines to foster co-migration.

Scope:

- Set up case studies on selected carbon-rich and biodiversity rich endangered European forests, such tropical forests, primary and old-growth forests, peat swamp forests or mangroves.
- Improve existing or develop new predictive models of biodiversity changes, improve the understanding of species connection with the forest habitat and analyse to what extent species can survive in a changed and fragmented habitat in view to establish best protected forest networks.
- Improve knowledge on the cross-impacts between biodiversity and climate by considering the impact of drivers of biodiversity loss on forest-based adaptation and mitigation and impacts of climate change on forest biodiversity and forest species migration, and links between forest species diversity and forest resilience to climate change.
- Develop approaches and guidelines for forest ecosystem migration and propose the design of 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.

HORIZON-CL6-20XX-BIODIV: Selective breeding programme for organic aquaculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

<i>Eligibility conditions</i>	
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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, successful proposals will develop a selective breeding programme for organic aquaculture and thus contribute 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”. Proposals are expected to contribute to all of the following outcomes:

- Contribute to a high level of biodiversity and to high animal welfare standards meeting the species-specific behavioural needs;
- Contribute to a non-toxic environment reducing the use of any external input;
- Reach good productive results and efficient use of the resources under organic production conditions;
- Significantly boost 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.

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 in the same time essential to allow the farmers to reach good productive results and efficient use of the resources under organic production conditions.
- The project should plan breeding programs under organic aquaculture for the main European aquaculture species. The project 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. R&I programs on different species and/or different climatic areas should be tailored to the specificity of the organic aquaculture production and each solution will have to be

carefully analysed, not only in terms of performance, but also in terms of the welfare of the farmed animals.

Heading 5 – Interconnection of biodiversity research and policies

HORIZON-CL6-2023-BIODIV: European Biodiversity Partnership: Biodiversa+ (second instalment)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX 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 XX 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>	The rules are described in General Annex G. The following exceptions apply: Beneficiaries may provide financial support to third parties in the form of grants only. The maximum amount to be granted to each third party is EUR XX for the whole duration of Horizon Europe. The EUR XX threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046 ⁷ does not apply as financial support to third parties is one of the primary activities of this action to allow the partnership to achieve its objectives.
<i>Total indicative budget</i>	The total indicative budget for the topic is EUR XX million.

⁷ Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012; <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R1046>

Expected Outcome:

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

This partnership will contribute to the objectives and targets of the EU biodiversity strategy for 2030 under the overarching objective that, by 2030, biodiversity in Europe is back on the path to recovery. A successful proposal will contribute to the EU Green Deal priorities, the Birds and Habitats Directives, and to EU climate and agricultural policies. It will help achieving the following expected impact: “interconnect **biodiversity research** and **support policies and processes** at EU and global levels, making use of advanced digital technologies where appropriate”. It will help connect biodiversity research across Europe, supporting and raising the ambition of national, EU and international environmental policies and conventions⁸.

- Biodiversity research and environmental policy institutions build up coherent initiatives through a co-funded European partnership.
- National/local and EU research & innovation programmes share information between programmes and with environmental ministries and agencies, combining in-cash and in-kind resources. EU and national/regional biodiversity research agendas from EU Member States and associated countries- are complementary; a long-term pan-European strategic research agenda implemented.
- Biodiversity monitoring in Europe is structured in the form of a network of coordinated observatories providing accessible knowledge on biodiversity and ecosystem services to users via the EC Knowledge Centre for Biodiversity.
- The partnership increases the relevance, impact and visibility of R&I and European leadership in tackling the biodiversity crisis.
- Biodiversity is mainstreamed across sectors and policies across Europe by using tools such as natural capital accounting and by rolling out nature-based solutions, including traditional and new technologies, which provide multifunctional and resilient solutions to complex societal challenges.

Scope: The European partnership on biodiversity ‘Rescuing biodiversity to safeguard life on Earth’ is one of the actions included in the EU biodiversity strategy for 2030. It should coordinate research programmes between EU and its Member States and associated countries and trigger combined action. For the first time, it should mobilise environmental authorities as key partners in carrying out biodiversity research and innovation, along with ministries of research, funding agencies, and environmental protection agencies. The partnership’s co-created strategic research and innovation agenda for seven years should include calls for research projects, biodiversity- and ecosystems monitoring and science-based policy advisory activities.

⁸ In particular, the UN Convention on Biodiversity, and the Sustainable Development Agenda 2030

The partnership should aim to achieve five overarching objectives:

1. Produce actionable knowledge to tackle both the direct and indirect drivers of biodiversity loss; produce knowledge on biodiversity status, trends and dynamics, and in integrating drivers, pressures, impacts and responses; produce knowledge on the trade-offs and synergies between multiple drivers of biodiversity change; and an assessment of new tools and approaches to biodiversity/ecosystem conservation and restoration;
2. Expand and improve the evidence base, accelerate the development and wide deployment of nature-based solutions to meet societal challenges across Europe in a sustainable and resilient way, contributing to protecting biodiversity while tackling multiple challenges such as the climate crisis while improving food and nutrition security, the water supply, addressing flooding and water scarcity, and tackling other societal priorities.
3. Making the business case for the conservation and restoration of ecosystems, by contributing science-based methodologies to account for and possibly value ecosystem services and the natural capital, and to assess the dependency and impact of businesses on biodiversity.
4. Improved monitoring of biodiversity and ecosystem services across Europe (status and trends), building on existing national/regional monitoring schemes, building new capacity for setting up new schemes, promoting new and efficient technologies and experience from processes related to mapping and assessing ecosystems and their services (MAES) with regard to enhancing and standardising tools for mapping and assessment.
5. Science-based support for EU, Member States and associated countries policy-making, including for strengthening and implementing environmental policies and laws, and improving cross-sectoral links synergies with other European sectoral policies. More generally, R&I programmes should be better linked to the policy arena, providing greater input to policy making and improving the assessment of policy efficiency. The European partnership for biodiversity should be implemented through a joint programme of activities ranging from research to coordination and networking, including training, demonstration and dissemination, to be structured along the following main work streams.

The further horizontal actions are key for the success of the partnership:

1. Actions to promote and support R&I programs and projects across the European Research Area, including launching ambitious joint calls to fund transnational R&I projects and run mobility schemes, for example for young scientists or between academia and business;
2. Actions to build R&I capacity and increase the impact of R&I programmes and projects, including science-based policy support;
3. Actions to support, harmonise and carry out biodiversity monitoring;
4. Measures to improve the uptake, demonstration and rollout of solutions to tackle the above-mentioned objectives of the partnership;

5. Measures to enhance the excellence, visibility and impact of European R&I at international level.
6. Measures to regularly update the partnership vision and strategy.

It is expected that the partnership organises joint calls on an annual base from 2022-2027 and therefore it should factor ample time to run the co-funded projects.

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.

Heading 6 – Biodiversity and health

HORIZON-CL6-2023-BIODIV: Prevention of zoonotic emerging diseases & biodiversity

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:

Expected outcome:

In line with the EU Green Deal and in particular with the objectives of the EU biodiversity strategy 2030, projects will develop the knowledge on the links between biodiversity loss/degradation and the emergence, spread and exposure of humans to infectious diseases. This will contribute to further understanding the **biodiversity and health nexus, in particular at the level of ecosystems**, in the context of climate change and globalization and address contributions and trade-offs.

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

- Better understanding on how biodiversity loss/degradation and dysfunctional ecosystems influence emerging infectious diseases,
- Support to the identification and monitoring of hotspot regions of high risk of emerging infectious disease through relevant biodiversity indicators and baselines

- More resilient and sustainable surveillance systems which will help early warning and action to reduce the risks of emerging infectious disease
- Enhance the biodiversity perspective of OneHealth approach in relation to emerging infectious diseases

Scope:

Zoonotic diseases, which result from cross-species transmission of pathogens between humans and other animals, appear to be emerging more frequently. Over the last decades, research has indicated that loss of biodiversity could simultaneously increase human exposure to existing pathogens, as well as increase the probability of the emergence of infectious diseases. The mechanisms behind these trends are inadequately understood.

This increased frequency of the emergence of infectious diseases of animal origin, demonstrates the need for a real paradigm shift: preventing the causes by focusing on the root causes and underlying mechanisms linked to biodiversity, as well as improving their early detection.

Coherence needs to be ensured with Cluster 1 relevant projects and other ongoing initiatives such as the European Biodiversity Partnership, the European Partnership for pandemic preparedness and the European Partnership for One Health/AMR Antimicrobial Resistance (AMR).

Proposals should address the following:

- Identification of biodiversity parameters and mechanisms linked to the emergence of infectious diseases at ecosystem level and indicators to monitor them,
- Investigation on how the different types of stressors that lead to biodiversity loss, degradation and transformation of natural habitats and dysfunctional ecosystems may lead to emerging infectious diseases,
- Establishment of baselines of the biodiversity parameters relevant to emerging infectious diseases,
- Identification and prioritization of hotspot/risk regions for emerging infectious diseases,
- Recommendations for efficient and quick detection and fast information sharing.

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, which is key to the success of the European Green Deal and achievement of the UN sustainable development goals (SDGs), aims to address these challenges and to deliver co-benefits for environment, health, society and the economy, ensuring that actions leading to recovery from the COVID-19 crisis also put us onto a sustainable path going forward. Research and innovation (R&I) are key drivers steering and accelerating the transition to sustainable, safe, healthy and inclusive food systems, from farm to fork, thereby ensuring food and nutrition security for all.

Sustainable, climate and biodiversity friendly farming systems provide economic, environmental, and social and health benefits, and are the main prerequisite for food and nutrition security. For farmers, who are the backbone of food systems and the immediate managers of natural resources, the new **common agricultural policy (CAP)** and the **European Green Deal** sets ambitious targets and objectives with respect to the sustainability and safety of feed, food and non-food production. These targets and objectives are included in the core Green Deal policy initiatives, in particular the **farm to fork strategy**, the biodiversity strategy, zero pollution efforts and climate action. R&I in line with the strategic approach to EU agricultural research and innovation⁹ will be key enablers for achieving these ambitious targets and objectives. More specifically, they will contribute to the following policy priorities: nine specific objectives of the new CAP; action plan on the development of organic production; food safety regulations; sustainable use of pesticides directive and regulations under the plant protection products framework; animal health and welfare legislations; One Health action plan against antimicrobial resistance; regulation on feed additives; legislative and non-legislative initiatives to enhance cooperation of primary producers and support their position in the food chain; legislative framework for sustainable food systems; and contingency plan for ensuring food supply and food security.

The following outcomes are expected:

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

⁹ <https://ec.europa.eu/programmes/horizon2020/en/news/final-paper-strategic-approach-eu-agricultural-research-and-innovation>

to knowledge, place-based tailored solutions and innovations, and improved and transformative governance and policies.

- Through **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 and enhancing food safety, quality. It will contribute to sustainable animal farming and the protection of public health and the environment.
- Support farmers in **managing natural resources (e.g., soil, water, nutrients, biodiversity, etc.)** in innovative, **sustainable ways**, through R&I boosting low impact farming, such as **organic and agroecological farming**, including by improving yields and phasing out harmful inputs and practices, promoting **EU plant protein production**, notably **legume crops**, and **integrated water management**, including **innovative irrigation systems**.
- Improve **plant health**, reduce farmer’s **dependency on pesticides** and reverse biodiversity loss.
- Enhance **sustainable livestock production** and animal welfare through improved knowledge on **nutritional requirements** and innovative on-farm practices and technologies for **optimised use of local feedstuffs**.
- Implement an EU common approach to optimise the management of co-existence of **outdoor livestock systems and wildlife** by integrating science and practice on the preservation, protection and valorisation of wildlife and agro-pastoral systems.
- Improve the position farmers in value chains and enable them to seize opportunities of green transition through **local economies, social innovation, new and sustainable business and production models** (e.g., new small-scale food production approaches, including novel minimal, organic on-farm processing).
- Empower and interconnect farmers through the use of **advanced digital and data technologies** (such as AI, IoT, robotics) that support sustainable farming approaches, e.g., precision farming and product traceability.
- Enable farmers to **maximise provision of ecosystem services** to the whole society, while ensuring resilient primary production, notably by valorisation of ecosystem services provided by **legume crops**.
- Better equip farmers to make a significant contribution to **climate-neutrality** and become more **resilient to climate change** (Destination ‘*Land, ocean and water for climate action*’).
- Support policymakers and actors across agri-food systems in creating market conditions and developing and implementing effective **policies**, in particular **CAP, sustainable food systems framework law, contingency plan, environmental and food safety policies**, enabling transition to sustainable and resilient farming and food systems

(Destination ‘*Innovative governance, environmental observations and digital solutions*’).

- Boost effective **agricultural knowledge and innovation systems** (AKISs) that 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*’).

Sustainable fisheries and aquaculture contribute directly to environment-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) and increasing climate-neutrality and resilience and safeguard aquatic biodiversity. R&I will support the “**strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030**”, that propose specific actions including access to space and water, human and animal health, environmental performance, climate change, animal welfare, the regulatory and administrative framework, and communication on EU aquaculture. Additionally, the new **EU algae initiative**, to unlock the full potential of sustainable algae-based food and alternative feed sources, and the promotion of **organic aquaculture** can contribute to the transition to sustainable food systems. R&I will also contribute to the success of the **common fisheries policy** and deliver 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 Blue Economy Partnership.

The following outcomes are expected:

- Make **fisheries and aquaculture more precise, technologically advanced**, fully embedded in the natural and socio-ecological system context including by reducing the footprint on aquatic biodiversity.
- Better equip **fisheries and aquaculture** to become more **resilient to climate change adverse consequences** and to make a significant contribution to **climate neutrality** and.
- Enable European **aquaculture industry** to achieve its **full potential for ensuring global food security** in terms of volume, methods (e.g. organic production, improved regulations, poly-cultures), variety of species (including low trophic level species), aquatic species welfare, safety and quality of products and services.
- Better understand 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** to facilitate the adaptation of fishing vessels, fishing gear and catch methods to reduce the carbon footprint and to adapt to the changing climate regime.

- Better understand **climate change impacts** in terms of **stocks shifts, species composition and altered growth and reproduction rates** allowing the fishing vessels, gears and methods to be adapted to the changing climate regime and to have less carbon footprint.
- Enable **aquaculture** to become more sustainable with highly efficient use of resources, **climate-neutral and 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.

Sustainable, healthy and inclusive food systems rely on systemic, cross-sectoral and participatory, multi-actor approaches and the 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 natural resources, primary production and harvesting from land and sea, food processing and packaging, food distribution and retail, food services, food consumption, food safety, nutrition and public health, and food waste streams. The **European Green Deal**, complemented by the "**Fit for 55**" package, seeks to cut EU carbon emissions by 55% by 2030 and, in particular, achieve climate-neutrality by 2035. The European Green Deal flagship initiative – **farm to fork strategy** – supports a shift to more resilient and environmentally, socially and economically sustainable food systems, as required to deliver safe, healthy, tasty, accessible and affordable food and diets for all, sourced from land and sea, while respecting planetary boundaries. An important driving force of food systems transformation should be the **integration of sectors, actors and policies**¹⁰. This will involve a better understanding of the multiple interactions between the actors and components of current food systems, of lock-ins and potential leverage points for synergistic changes and of the interdependencies of outcomes (interlinkages between nutritional climate and sustainability outcomes). Such knowledge will foster 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; and innovation and empowering communities. The farm to fork strategy and Food 2030 initiative place the focus on all food system actors, especially the **SMEs and consumers**, and highlight their crucial role in improving food systems. Furthermore, this destination will help build ecosystems of innovation to bring together relevant public and private sector actors, researchers and society. It will take advantage, where relevant, of advanced digital technologies.

The following outcomes are expected:

- The **partnership for 'sustainable food systems for people, planet and climate'** builds on the Food 2030 policy framework. It will accelerate the transition towards equitable, healthy and sustainable food systems in Europe and beyond via an EU-wide targeted research and innovation. It will help to close knowledge gaps, increase health and food literacy and deliver innovative solutions, including social innovation, which provide co-benefits for nutrition, climate, circularity and communities. It will also leverage investments and align multiple actors towards common goals and targets, and also

¹⁰ Scientific Advice Mechanism, [Towards a sustainable food system - Publications Office of the EU \(europa.eu\)](https://publications.ec.europa.eu/towards-a-sustainable-food-system)

contribute to the further build-up of the European Research Area in support of sustainable food systems transformation at various scales.

- Provide **food businesses and industries, including food processing and packaging, retail and distribution, hospitality and food services**, with opportunities and incentives to stimulate sustainable, circular and diversified practices and products that are climate-neutral and less reliant on fossil fuels.
- Better understand the behaviour and needs of **consumers, citizens** and communities and empower them with knowledge, capacities and tools that facilitate the shift to healthy, sustainable diets and responsible consumption, enhanced also by social innovation, technology, behavioural change and marketing standards.
- Through improved knowledge and innovative solutions, contribute to eradicating micronutrient deficiencies in vulnerable population groups across EU, **develop new high quality, healthy, minimally processed and sustainable food products and processes, which preserve nutritional values of raw materials to improve health of EU citizens**.
- Improve knowledge of barriers to and options to promote the transition to high quality, **sustainable and healthy diets** that integrate **innovative and novel foods based on alternatives sources of proteins, and their respective consumer acceptability**.
- Prevent and reduce **food loss and waste** through improved marketing standards and channels, better collaboration between countries inside and outside Europe, improved resource efficiency and carbon neutrality along and across multiple food value chains.
- Reduce the **environmental impacts and pollution** from the food value chains (Destination ‘*Clean environment and zero pollution*’).
- Further unlock and use the potential of the **microbiome**, for example to fight **food waste** and to develop **alternative sources of proteins**.
- Better share and exchange knowledge between food system actors on **food fraud and food safety** including traditional and local products. Improve knowledge of the influence of **climate change on food safety**.
- **Food systems transformation takes shape in the places where people live and work**, hence in towns, cities and urban areas, including via the use of nature-based solutions in the context of the **European Bauhaus initiative** (Destination ‘*Resilient, inclusive, healthy and green rural, coastal and urban communities*’).
- **Improve food systems governance**, for example through robust organisational and institutional design, social transformation and by empowering communities at local and regional scales, a strengthened science-policy interface and systems science (Destination ‘*Innovative governance, environmental observations digital solutions in support of the Green Deal*’).

- Further develop **digital and data-driven innovation** ecosystems to drive sustainable, healthy and inclusive food systems (Destination ‘Innovative governance, environmental observations digital solutions in support of the Green Deal’).

The EU also aims to promote a **global transition to sustainable food systems**. The EU’s relationship with Africa is a key priority for the EU. 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 contribute to this ambition and 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. In particular, advances will be made in agroecology, including agroforestry earth observation and monitoring, food safety and fair trade.

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 globally**.

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

- Enable **sustainable**, productive, climate-neutral, environment-friendly and resilient **farming systems** providing consumers with affordable, safe, traceable, healthy and sustainable food and increasing the provision of ecosystem services, while restoring and enhancing biodiversity, minimising pollution and pressure on ecosystems and emissions of greenhouse gases, fostering plant, animal and public health, improving animal welfare, and generating 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, diversification of seafood products, for fair, healthy, climate-resilient and environment-friendly food systems with lower impact on aquatic ecosystems and enhanced 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.

Proposals are invited against the following topic(s):

Heading 1 – Enabling sustainable farming systems

HORIZON-CL6-2023-FARM2FORK: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding
<i>Legal and financial set-up of the Grant Agreement</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. 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 XX threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046102 does not apply. The maximum amount to be granted to each third party is EUR XX for the whole duration of Horizon Europe
<i>Total indicative budget</i>	<i>The total indicative budget for the duration of the partnership is EUR XX million.</i>

Expected outcome:

In line with the European Green Deal, this partnership will contribute to the objectives and targets of the EU Farm to Fork Strategy for a transition to fair, healthy and environmentally-friendly food systems from primary production to consumption, and in particular the ambition to boost agroecology. Given the potential of agroecology to deliver positive impacts for the transition towards environmental, economic and social sustainability of Europe’s farming systems, the partnership will deliver solutions that will support the implementation of several other Green Deal strategies and initiatives, notably: the EU Biodiversity Strategy 2030; the Action Plan for the development of organic production; the Zero Pollution Action Plan; the 2030 Climate Target Pact; the EU Soil Strategy for 2030, and not least, the new Common

Agricultural Policy. The expected outcomes of the partnership will therefore also contribute to the impacts of other Destinations under Cluster 6 of Horizon Europe, as well as to the Sustainable Development Goals, in particular SDGs 2, 3, 6, 12, 13 and 15.

Partnership activities are expected to contribute to all the following expected outcomes:

- Increased capacities of farmers and value chain actors across Europe to implement agroecological practices that contribute to positive ecological, climate and environmental impacts, and to inclusive, competitive and resilient agri-food systems.
- Robust European R&I system for agroecology integrating science and practice that will set the direction for expanding existing and building up new collaborations, boosting knowledge creation and sharing, and co-creating place-based and tailored solutions that will improve the understanding, the performance and the uptake of agroecology in Europe.
- Strengthened science-policy dialogue on agroecology, providing scientific support for relevant EU policies and supporting evidence-based, systems-oriented and transformative governance & policy-making, leading to policies and institutions that are more open, flexible, participatory and risk sharing.

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. It should coordinate research programmes between the EU and its Member States and Associated Countries and trigger combined action. The partnership’s co-created strategic research and innovation agenda will boost fundamental research on agroecology through to applied research, giving rise to ready-to-use solutions for the scaling up in real-life environments and demonstration of prospective implementation strategies. The partnership will cover issues related to the transition to agroecology in all agricultural production systems (conventional agriculture, organic farming, agroforestry, permaculture, regenerative agriculture).

The partnership should aim to achieve five specific objectives:

- Increase research-based knowledge on the benefits and challenges of agroecology and its potential for farming, food, climate, ecosystem services and society, as well as for reducing environmental impacts and resource use.
- Develop and co-create innovations to reduce and share the challenges of the agroecology transition for both individuals and collectives.
- Improve the sharing and access to knowledge on agroecology 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 to measure progress of the agroecology transition and improve data valorisation and sharing.
- Foster dialogue with policy makers (research and sectoral) and stakeholders on agroecology transition and mainstreaming of agroecological practices, with a view to contribute to improved governance and policies, as well as institutions that are better equipped to move the transition forward.

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

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Legal and financial set-up of the Grant Agreement</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. 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 XX threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046102 does not apply. The maximum amount to be granted to each third party is EUR XX for the whole duration of Horizon Europe
<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR xx million.

Expected outcome: In line with the European Green Deal, this partnership will contribute to the objectives and targets of 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 (R&I) to help policy makers, animal health industry and other relevant actors to provide society with reassurance on the 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 environment-friendly food systems from primary production to consumption', as well as to the Sustainable Development Goals, in particular SDGs 2, 3, to the One Health approach and to the CAP.

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

- Preparedness against upcoming and emerging threats to animal health, including zoonoses, is strengthened for both animals and humans
- Animal welfare is promoted and strengthened
- Innovative methodologies and products for animal infectious diseases and animal welfare monitoring and control are generated
- Evidence is provided to support policy making on animal health and welfare
- The European Research Area in the area of animal health and welfare is strengthened

Scope:

The partnership should aim to achieve the following objectives:

- 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 R&I programs and joint integrative activities among research performing organisations and other actors and stakeholders, to organise education and training activities, mobility schemes.
- Actions will be undertaken to boost research and to increase the evidence-base to develop products 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
- Actions to support surveillance, detection, risk assessment and alert communication, prevention, 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 from animals, food and the environment to 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, especially regarding zoonoses and antimicrobial resistance

- To strengthen general and targeted communication on the outputs of the partnership and dissemination of its deliverables to partners, national and international stakeholders, and all other possible users, to stimulate their uptake and implementation.
- Measures to regularly update the partnership vision and strategy, in particular to address new needs, for instance emergencies, policy implementation, stakeholders' interests, societal demands.

HORIZON-CL6-2023-FARM2FORK: Increasing the availability and use of harmless inputs in organic farming

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	Multi-actor The conditions are described in General Annex B.

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 the Action Plan for the Development of Organic Production¹¹ and of Regulation (EU) 2018/848 on the rules on organic production and labelling of organic products¹².

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

- Increased availability of widely accessible and cost-efficient alternatives to harmful inputs in organic farming
- Fair, reliable and implementable rules on the use of inputs in organic production
- Reduced environmental impact and enhanced climate, environmental, social and economic performance of organic farming systems and product quality

¹¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29>

¹² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32018R0848>

- Provision of scientific support for relevant EU policies

Scope:

- Test in different pedo-climatic and farming conditions in the EU alternatives and combination strategies, including through the adoption of system’s approaches considering the entire farm system, the territory and landscape levels.
- Develop, test and put in the place alternative plant protection solutions, including products containing biological active substances, invertebrate biological control agents or cultivation techniques and considering effective functional biodiversity systems.
- Demonstrate the safety of alternatives in accordance with relevant EU regulatory frameworks related to their placing on the market, and generate data to enable registration of less toxic alternatives.
- Deepen analysis and produce data on the efficacy and environmental impacts of the alternatives developed, including analysis of farmers’ and consumers’ acceptability and considering the development of new governance models/relations among food chain actors.
- Target specific sectors with high economic relevance in the EU and Associated Countries and cover a range of crops (in and outdoor), both arable and perennial, as well as livestock production.
- Set up and pilot a network of demonstration farms to promote participatory demonstration 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, including communication activities engaging citizens and consumers.
- Proposals should take into consideration the results of past projects, notably those funded under the Horizon 2020 call ‘SFS-08-2017 - Organic inputs – contentious inputs in organic farming’. Proposals should include a plan on how they will collaborate with other projects funded under this topic.

HORIZON-CL6-2024-FARM2FORK: Improving yields in organic crop systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Actions

<i>Eligibility conditions</i>	Multi-actor The conditions are described in General Annex B.
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Expected outcome: Boosting sustainable farming approaches such as organic farming is strategic for achieving the objective of the farm to fork strategy to transition to fair, healthy and environmentally-friendly food systems from primary production to consumption. Project implementation is expected to contribute to the target of at least 25% of the EU's agricultural land under organic farming by 2030. Activities will support the implementation of the Action Plan for the Development of Organic Production.

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

- Increased and accelerated availability, accessibility and adoption of strategies and approaches with demonstrated capacity to improve organic crop yields
- Enhanced climate, environmental, social and economic performance of organic farming systems
- Increased networking and knowledge exchange among Member States and Associated Countries, synergies with the EIP-AGRI Operational Groups and research projects
- Provision of scientific support for relevant EU policies

Scope:

- Set up a European-wide network of testing, experimentation and demonstration sites to co-create and showcase in a participatory approach strategies that improve organic crop yields.
- Organise and implement knowledge and best practices exchange activities and develop practical guidelines and decision-support tools for farmers.
- Identify most relevant crops in organic production for which improved yields can be achieved based on previous research projects and propose crop-specific strategies to increase yields. Due attention should be given to holistic approaches.
- Identify remaining gaps and develop a research and innovation road map to boost organic crop yields.
- Cover all European bio-geographical regions and a wide range of crops (arable and perennial) representative of the diversity of the European organic sector. Collaboration among projects to be funded under this topic should be ensured.

Proposals should include a plan on how they will collaborate with other projects funded under this topic.

HORIZON-CL6-2023-FARM2FORK: 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 XX million EUR (2 projects) 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 XX million EUR.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility and admissibility conditions</i>	The conditions are described in General Annex B. 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 Biodiversity strategy 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 new Common Agricultural Policy put into practice eco-schemes which support a list of good agricultural practices such as the inclusion of leguminous crops in rotation within agro-ecology systems.

Activities will also support the implementation of the Action Plan for the Development of Organic Production.

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

- Improved quantification, in environmental and economic terms, of the ecosystem services provided by legume crops.
- Increased knowledge and capacity of farmers to include minor and major legume crops in their cropping schemes with a positive ecological and economic impact.

Scope:

The proposed activities will:

- Increase knowledge on the different and complementary benefits from the use of legume crops in the provision of ecosystem and environmental services (e.g. value of the nitrogen transfer to succeeding crops, efficiency of different legume crop varieties in N-fixing in the soil in function of specific conditions, etc.).
- 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 and disease management and increased crop and microbial diversity.
- Remove the barriers of crop diversification for farmers, providing indicators so that farmers and advisors are better equipped to value the benefits of growing legumes as well as recommendations to strengthen crop diversification practises on the long-term. This should facilitate the market penetration of leguminous crops, increase their consumption and influence the transition towards more sustainable and healthy food systems.
- Include minor or underutilised crops (annual or perennial legume varieties) that are not classical object 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 stress and climate change.
- Seek potential synergies with already ongoing projects where the economic and ecological value of the cultivation of protein crops are considered, both in the EU and beyond (e.g. initiatives in Africa linked to the Great Green Wall) and capitalize on their results.

HORIZON-CL6-2024-FARM2FORK: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action

<i>Eligibility conditions</i>	Multi actor approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding
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Expected outcome: A successful proposal should support the farm to fork strategy for a transition to fair, healthy and resilient agriculture and forestry and Regulation (EU) 2016/2031 on protective measures against plant pests.

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

- Cost-efficient and user-friendly tools and methods for detection of plant pest to assist plant health inspectors during import controls;
- Increase efficiency of detection of plant pests at import points, by decreasing time and overall costs;
- Support the effectiveness of plant health inspections and import controls

Scope:

More effective measures for plant health have been put in place in Europe. These new measures aim to ensure safe trade, as well as to mitigate 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, as e-noses, acoustic technologies, scanners, and portable devices for identification of plant pests within hours/minutes of the specimen examination often using limited amounts of plant or non-plant material, and other relevant solutions are included within the scope of this topic.

Proposals should:

- Deliver more rapid and innovative solutions appropriate for detecting and identifying plant pests during import controls and, when relevant, the surveillance of plant pests in the EU territory;
- Foster a wider use of new accurate detection technologies, such as volatiles and molecular detection approaches;
- Prove cost-benefits of the innovative solutions.

HORIZON-CL6-2024-FARM2FORK: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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.

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 ones, to sustain crop productivity and contribute to sustainable agriculture and/or forest health.
- Minimized pesticides impact on human and animal health, terrestrial and aquatic ecosystems, drinking water, soils and the food chain.

Scope:

Active substances with certain properties defined in Regulation (EC) No 1107/2009 are considered as candidates for substitution. For Plant Protection Product (PPP) containing these active substances, Member States are required, when assessing an application for authorisation, to evaluate if these PPP 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 losing their efficiency due to emergence of resistant pests/insects.

Proposals should:

- Introduce alternative approaches, tools, strategies, agents, and/or substances (either conventional or biological) for prevention and (bio) control of plant pest¹³ with improved environmental performance (e.g. reduced effects on non-target organisms, natural resources

¹³ 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)

and the environment) and acceptable efficacy, enlarging the toolbox of integrated pest management;

- Improve current agronomic, ecological and cultural practices to increase the resilience of agricultural production against biotic stresses;
- Improve the application of smart decision support systems for crop protection integrating modelling, phenology and remote sensing approaches to reduce the use of plant protection products in agriculture
- Assess the social, economic and environmental trade-offs of the alternative developed.
- Demonstrate the safety of alternatives in accordance with relevant EU regulatory frameworks related to their placing on the market.
- Set up and pilot a network of farms to promote participatory demonstration activities, and the exchange of knowledge and best practices among farmers.

Proposals should include a plan on how they will collaborate with other projects funded under this topic.

HORIZON-CL6-2024-FARM2FORK: Emerging and future risks to plant health

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi actor approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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.

This topic will benefit both conventional and organic farming.

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

- Find adequate responses to new and/or emerging plant pests;

- Improve the understanding of drivers of plant pest emergence including the influence of climate change, ecosystem degradation and globalisation;
- Develop economic and environmentally sound solutions for effective pest management in farming and forestry in line with the principles of integrated pest management;
- Support to relevant plant health policies in the EU and Associated Countries.

Scope: Proposals should target one or more new or emerging¹⁴ plant pests¹⁵ (regulated, non-regulated, introduced or native) that are causing or likely to cause, significant (socio) economic and/or environmental losses to agriculture and/or forestry in the EU and/or Associated Countries. Within the scope of this topic are pests exhibiting an altered and higher probability of entry and spread in a new area that might be the result of changes in their biology or changes in agriculture or forestry pest management practice or rapid spread in new areas. The choice of target pest(s) should consider the potential threat in terms of development and spread, its potential exacerbation under climate change as well as the potential impact on agricultural production, forestry, trade and the wider environment (including soil and water).

Proposals should:

- Increase knowledge of the biology, pathways of entry, behaviour in the plant-soil system where relevant, and drivers of spread of plant pest(s) including the influence of climate change and globalization of pest(s);
- Improve methods and strategies for prevention, early detection and surveillance of plant pest(s);
- Develop and uptake rapid and effective tools for the prevention of entry, spread and establishment, early detection, surveillance, treatment and (bio) control of plant pests for a sustainable and integrated pest management;
- Identify and introduce resistance traits to support the long-term sustainability of agriculture and forestry in the EU and/or Associated Countries;
- Assess the social and economic implications for farmers and ecological impacts of the plant pest(s) and the development of approaches on how to best cope with these situations;
- Integrate citizen science as a tool to monitor emerging plant pests.

HORIZON-CL6-2023-FARM2FORK: Tackling outbreaks of plant pests

Specific conditions

¹⁴ EFSA Scientific Colloquium XVI

¹⁵ 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)

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi actor approach The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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.

This topic will benefit both conventional and organic farming.

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

- Find adequate responses to EU quarantine plant pests;
- Enhance capacities to prevent, monitor and (bio)control important plant pests;
- Support to relevant EU and Associated Countries' plant health policies.

Scope: Proposals should target one or more plant pest(s)¹⁶ that are either Union quarantine plant pests¹⁷ present in the EU or Union quarantine pests which are priority pests¹⁸ in the EU, and that are of concern for agriculture and/or forestry. They should improve methods and strategies for surveillance and control, and extend the range of tools for integrated and effective pest management.

Proposals should:

- Contribute to the understanding of the drivers of plant pest spread and establishment including the biology of the pest and its interaction with host plants, 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).

¹⁶ 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)

¹⁷ See part B of Annex II to Commission Implementing Regulation 2019/2072 for pests known to occur in the Union territory

¹⁸ See Annex to Commission Delegated Regulation (EU) 2019/1702 for priority pests.

- Extend the range of tools and technologies available for the development of economically and environmentally sound solutions for effective pest prevention and management in farming and forestry in line with the principles of integrated pest management and taking into account the use of biological control methods.
- Analyse the social and economic implications for farmers affected by the plant pest(s) and developing approaches whereby those affected can best cope with the situation.
- Analyse the ecological impact of plant pest(s) spread and establishment.

HORIZON-CL6-2023-FARM2FORK: Animal welfare in transport and at slaughter (in reserve, depending on partnership animal health and welfare)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

In line with the farm to fork strategy, for a transition to fair, healthy and resilient livestock production systems, including the improvement of animal welfare and reduction of anti-microbial usage, a successful proposal will support research and innovation (R&I) to help policy makers and other actors (e.g. economic operators) monitor and improve animal welfare in transport and at slaughter, thus contributing to sustainable agriculture.

Scope:

Proposals should address different species of terrestrial animals and the following:

- Developing or improving technology to detect and monitor animal welfare issues during transport, notably over long journeys
- Assessing impact of space allowance on animal welfare during the transport (notably for pigs)

- Developing a system of analysis of lesions/ body condition parameters in slaughterhouses and linking to animal welfare state/history.
- Comparative analysis and development of new stunning methods (pigs, poultry, cattle), including on effective and economical stun-kill methods for mobile and/or low volume slaughterhouses.
- Proposals should fall under the concept of multi-actor approach, involving at least representatives of practitioners (e.g. veterinarians), of the transport and slaughter sectors.

HORIZON-CL6-2023-FARM2FORK: Enhancing animal welfare friendly non-caged farming (in reserve, depending on partnership animal health and welfare)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million. <i>(for two projects)</i>
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

In line with the farm to fork strategy, for a transition to fair, healthy and resilient livestock production systems, including the improvement of animal welfare and reduction of anti-microbial usage, a successful proposal will support research and innovation to help policy makers and other actors (e.g. economic operators) improve and monitor on-farm animal welfare aspects.

Scope:

Proposals should address all the species of interest on relevant aspects below:

- Developing or improving non-caged systems for keeping animals (at least for ducks, geese, quails and rabbits).
- Assess impact of poultry production practices on animal welfare and develop tools to address related issues in non-caged systems (at least in laying hens, broilers and turkeys).

- Developing systems for monitoring and analysing animal welfare in non-caged systems, including quantitative animal welfare criteria.
- Developing a system to assess co-benefits and trade-offs between animal welfare in non-caged systems and other aspects of production, e.g. animal health, impacts on climate and environment.
- Assess impacts of breeding strategies on animal welfare and develop tools to address related issues in non-caged systems (at least in laying hens).
- Design innovative tools to foster knowledge of staff handling animals.
- Proposals should fall under the concept of multi-actor approach, involving at least representatives of practitioners (e.g. veterinarians, farmers), and, where appropriate, social and environmental scientists.

HORIZON-CL6-2023-FARM2FORK Advancing vaccine development for African swine fever (*in reserve, depending on partnership animal health and welfare*)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected Outcome:

In line with the farm to fork strategy, for a transition to fair, healthy and resilient livestock production systems, including the reduction of anti-microbial usage, a successful proposal will support research and innovation to help policy makers and economic operators reduce the burden of infectious animal diseases, thus contributing to a sustainable livestock industry.

Scope:

Proposals should:

- Explore new approaches to African swine fever vaccine development.
- Address the necessary steps for developing vaccines against African swine fever for domestic pigs and wild boars.
- Develop pilot vaccines and their companion DIVA test.

- Build on past or ongoing EU funded research, such as VACDIVA and DEFEND.

HORIZON-CL6-2024-FARM2FORK: Alternatives to traditional antimicrobial medicinal products (*in reserve, depending on partnership animal health and welfare*)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: In line with the farm to fork strategy, for a transition to fair, healthy and resilient livestock production systems, including the reduction of anti-microbial usage, a successful proposal will support research and innovation (R&I) to help policy makers and economic operators reduce the burden of infectious animal diseases, thus contributing to a sustainable livestock industry and to the fight against anti-microbial resistance.

Scope:

Proposals should address at least ruminants and poultry¹⁹ and the following:

- To develop and test new, efficient and targeted alternatives to traditional anti-microbial medicinal products. This could be any type of alternative intervention measures (prophylaxis/prevention or treatment), other than vaccines.
- Study modes of action to facilitate recognition as feed additives or veterinary medicines. Take into account the guidelines, standards and legislation in the field, to facilitate the marketing of the measures the project will identify.
- Alternatives used already in particular in organic farming could be assessed
- Address risk of resistance development
- Proposals should fall under the concept of multi-actor approach, involving at least representatives of practitioners (e.g. veterinarians), of the feed/feed additives and pharmaceutical industries

¹⁹ For information: pigs are already addressed by AVANT project

HORIZON-CL6-2024-FARM2FORK: Animal nutritional requirements and nutritional value of feed under different management conditions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome:

- Guidelines for processes and policies for improved resource production, use and diversification of feedstuffs
- Optimised use of feedstuffs, new plants, forage species and associations at local level
- Uptake by other farmers of practices to diversify sources of feedstuffs
- (Alternative) Feed production/supply strategies that facilitate self-sufficiency of feed; closed nutrient cycle at local level

Scope: Optimise the use of local feedstuffs, shorten supply chains and rely more on local resources. Investigate content, availability and digestibility of nutrients in locally available feedstuffs.

- Identify and adjust nutritional requirements (macro and micronutrients) for local breeds and different management conditions, including organic livestock farming
- Assess on-farm practices and equipment to use feedstuffs more efficiently (post-harvest technologies, crops mixture, foraging strategies)
- Improved knowledge on the effects of certain ingredients (enzymes, gut flora stabilisers, etc.) on animal performance, health and welfare.
- Assess and minimize the risk of anti-nutritional factors or contaminants in feedstuffs
- Analysis of the performance of the 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)

HORIZON-CL6-2024-FARM2FORK: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome:

- 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

Scope:

To implement a common and integrated approach at EU level to optimize the management of the co-existence of wildlife (large carnivores, ungulates) and agro-pastoral/outdoor production systems. The following elements must be incorporated:

- Review of current wildlife management approaches in agro-pastoral/outdoor production systems in the different EU countries and assessment of the effectiveness of different prevention measures
- Mapping most common types of damage as well as of positive externalities caused by wild animals to livestock and crops in Europe. Inventory of good practices 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 behavior and damages

- Cost/benefit analysis of current and new adopted farming strategies that preserve, protect and valorise wildlife and pastoralism in different regions and ecosystems.
- Assessment of stakeholders' (farmers, hunters, conservationists, general public, policy makers...) perspectives and needs (participatory approach). Improve or develop effective instruments to reduce conflicts between farming and wildlife. Mitigation of damages and most common (monetary, non-monetary) compensation mechanisms across Europe identified.

HORIZON-CL6-2023-FARM2FORK: 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 EUR XX 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 XX million.
<i>Type of Action</i>	CSA/RIA

Expected outcome:

- Assembled comparable and sound data on values and externalities from the livestock sector under internationally agreed methodology
- Quantitative, qualitative and monetized evidence of the social, economic and environmental impacts and externalities of livestock production systems as well as trade-offs/synergies provided
- Recommendations/policy advice on more effective measures in mitigating negative externalities and increasing positive externalities
- 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:

- Provide a comprehensive and evidenced based study on the positive and negative impacts and externalities of livestock farming systems in different social and environmental contexts across Europe at farm, landscape and regional levels
- Support public authorities and other organizations in the assessment of the socio-economic-environmental impact of livestock production systems around Europe

- Communicate science base evidence of the impacts of terrestrial livestock systems on climate, environment and biodiversity as well as potential for improvement towards sustainable livestock systems
- Mapping of research and innovation projects as well as complementary initiatives on impact and externalities of different livestock farming systems
- Methods and indicators to measure the scale, range and degree of identified externalities in different livestock systems developed
- Data on the aggregated effects of environmental, social and economic externalities available to allow the assessment of net global impact.
- Improved understanding of livestock systems co-benefits for biodiversity, land use/change, circularity, GHG emissions/savings, ecosystem services, energy consumption, air/water/soil quality, human diet/health, animal health and welfare, food and nutritional security
- Analysis of relationships between different livestock systems, ecosystems and human systems at regional level carried out

HORIZON-CL6-2023-FARM2FORK: Exploring markets of agricultural inputs to support farmers' decision-making

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: A successful proposal should support the European Green Deal objectives, and in particular the farm to fork strategy and the Common Agricultural Policy (CAP).

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

- Better understanding of market concentration, power relations and dynamics, including contractual relationships and distribution of costs, benefits and risks along the agriculture input supply chains;

- Improved decision-making of farmers in relation to the purchase and use of agricultural inputs;
- Enhanced economic, social and environmental sustainability, climate neutrality and competitiveness of farms in the EU.

Scope:

The proposals are expected to:

- Focus on farm input sectors, in particular the seed, feed, energy, fertilizer, plant protection agents, and machinery (incl. digital components of machinery) from two perspectives: the demand supply sides.
- Analyse the structure and dynamics of the agriculture input supply chains.
- Assess the market concentration / power relations along the upstream of agri-food value chains, including distribution of costs, benefits and risks.
- Analyse the relationships between farmers and input suppliers, and the role of producers' organisations.
- Investigate the impacts of increased concentration / power relations (incl. contractual relationships) on different aspects, including farmers' rights to decent livelihoods, decision-making autonomy, on labour conditions, on the direction of innovation and sustainability performance at farms, etc.
- Generate in-depth insights into prices of agricultural inputs and their determinants and dynamics (past, current and future).
- Develop tools to support farmers' decision-making to optimise the purchase and use of agriculture inputs with view to improve climate and sustainability performance of the farming systems.
- Connection to activities of ERA and PERA (Partnership Environmental Risk Assessment), developing landscape models based on EFSA assessments (e.g. Conclusions on Pesticides) for facilitating the selection of the best options for their landscape structure and environmental conditions, is advised.

HORIZON-CL6-2023-FARM2FORK: Investigating geographical indications (GIs) contribution 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: The successful proposal should support the objective of the farm to fork strategy for sustainable food as well as to strengthen the system of geographical indications (GIs).

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

- Better understanding of the contribution of GIs schemes to sustainable development.
- Sustainable practices in GI schemes are widely implemented by the producers and recognized and highly valued by consumers.
- Better design and implementation of GIs policy to foster their delivery of overall sustainable agriculture and food systems.

Scope:

Building on the state-of-the-art (inter alia the results of the Strength2Food project), the proposals are expected to focus on GIs schemes:

- Provide a sound analysis of the state-of-the art in research on the impacts of GIs schemes on sustainability.
- 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 environmental impacts and at the same time balance the economic and social dimensions of sustainability.
- Identify the type and characteristics of public goods generated by the GI production to society and local areas.
- Investigate how to better valorise the sustainable deliverables of GIs.

- Identify synergies among different intervention schemes in order to increase the participation of farmers and fishers, and better promote GIs to increase demand and willingness to pay for GIs.
- Explore and benchmark the approaches/policy followed by the different Member States when it comes to GIs and sustainability
- Elaborate the best practices, decision tools, recommendations for the use by producers and policymakers to improve sustainability of the GIs schemes and optimise the support for newly established GI schemes.

HORIZON-CL6-2024-FARM2FORK: New business (and production) models improving farmers’ position in value chains and enabling transition to sustainable agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. 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 should support the European Green Deal initiatives, notably the farm to fork strategy and the Common Agricultural Policy (CAP) by developing innovative agricultural business models to improve economic outcomes, inclusiveness and fairness, and at the same time achieve high sustainability, climate neutrality and meet societal expectations.

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

- Farmers widely adopt innovative inclusive and sustainable business (and production) models in a variety of contexts;
- Improved inclusiveness, fairness and financial sustainability of trading relationships between farmers and upstream/downstream agribusiness;
- Increased sustainability of farming systems in economic, social and environmental terms.

Scope:

- Investigate ways to translate improved social and environmental performance into economic profit and competitive advantage of farms.
- Explore social innovation and innovative forms of cooperation, including multi-stakeholder/multi-actor partnerships along the agri-food value chains;
- Design and test innovative business (and production) models in different contexts that improve farmers’ position in value chains and enable them transition to sustainable agriculture.
- Create and widely share via a European-wide platform practical innovations (including digital and social), tools, best practices and guidelines to successfully develop and implement novel inclusive and sustainable business (and production) models.
- Connect citizens with farmers to increase demand for sustainable agriculture and create a market for new business models.

HORIZON-CL6-2024-FARM2FORK: Sustainable organic food innovation labs: focus on minimal, on-farm processing & circular value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. 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: In line with the farm to fork strategy, the successful proposals will support the organic action plan, thereby the achievement of the target of at least 25% of the EU's agricultural land under organic farming by 2030. The proposals should also support the successful implementation of the Common Agriculture Policy (CAP) and the new Circular Economy and the Zero Pollution Action Plans.

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

- Increased availability of organic food with positive impacts on sustainability and public health;

- Reduced food and packaging waste (in particular plastics) through circular use of raw material and optimised processes between farming, processing and other operations along the food value chains;
- Added value to agriculture produce, improved farmers' income and their position in agri-food value chains;
- Enhanced market orientation and capacity of farmers and small and medium scale processors to meet consumer demand for sustainable and healthy diets based on organic food.

Scope:

- Establish and animate locally-drive, multi-actor organic food innovation hubs, bringing together researchers, innovators, farmers, processors and others, to foster diverse innovative solutions (e.g., technological, social, etc.), support adoption of innovations at scale and develop a community of practice to share learnings and build capacity.
- Develop and pilot innovations to support:
 - organic on-farm food processing, in particular minimal, mild, careful processing with minimum packaging (and avoiding plastics), optimising the preservation of nutritional quality and reducing perishability, while ensuring food safety;
 - the shift from linear to circular organic production systems and value chains.
- Focus on innovative solutions/approaches:
 - tailored to the needs of farmers and SMEs, while ensuring links between food processing and primary production;
 - adapted to the seasonal character of raw material production and processing in small(er) batches.
- Test innovative solutions and assess their impacts sustainability (climate, environmental, social, incl. health, and economic).
- Develop and pilot appropriate business models, market outlets and marketing strategies that are adapted to proposed innovative solutions.

Heading 2 – Enabling sustainable fisheries and aquaculture

HORIZON-CL6-2024-FARM2FORK: Using species automatic recognition and artificial intelligence to fight illegal fish discards and revolutionise fisheries control

Specific conditions	
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<i>Expected EU contribution per project</i>	The European Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

In line with the European Green Deal objectives, both the Farm to Fork Strategy for a fair, healthy and environmentally friendly food system, and the Common Fisheries Policy aim to ensure that fishing and aquaculture are environmentally, 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 species automatic recognition and artificial intelligence to analyse data sources, such as video footage and sensor data in real-time.

To ensure that fisheries are environmentally, 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 digitisation of fisheries is a key element. This objective will also contribute to the headline ambition “A Europe fit for the digital age”.

Proposals are expected to contribute to the following outcomes:

- Effective methodologies, tools and systems for species automatic recognition, analysis of Remote Electronic Monitoring video footage 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;
- Increased ability by EU Member States to fully implement the Landing Obligation;
- Optimise fishing operations and enhance the EU ability to collect, exchange and analyse data, as well as improve monitoring capabilities and ultimately support a sustainable management of marine biological resources.

Scope:

Proposals are expected to address the following:

- Develop innovative and cost-effective solutions for species automatic recognition and quantification, and automatically analyse Remote Electronic Monitoring video footage and sensor data in real-time;
- 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.
- Test the suggested solutions in real conditions;
- 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);
- Investigate possibilities of integration of the results of the AI analyses for the automated catch recording and reporting;
- Recommend REM standardized 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;
- 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);
- Explore and recommend strategies to overcome possible resistance, by all stakeholders/parties, to implement the innovative solutions.

HORIZON-CL6-2024-FARM2FORK: Minimising climate impact on fisheries: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

Proposals are expected to contribute to the following outcomes:

- Enable 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 Biodiversity strategy for 2030 and the Farm to Fork strategy;
- Understand the resilience potential of exploited resources to climate change and build up the adaptive capacity for fisheries management;
- Enhance fisheries' resilience to climate change adverse consequences;
- Make fisheries more precise, technologically advanced, fully embedded in the natural and social ecosystem context;
- Prepare the seafood sector to seize opportunities to harvest shifting stocks in the most sustainable manner, taking into account environmental, social and economic considerations
- Better equip fisheries to make a significant contribution to climate-neutrality.

Scope:

Proposals are expected to:

- Investigate the impacts – and explore innovative solutions to minimize those impacts, such as dietary shifts and aspects of circularity – of climate change on biological and ecological processes such as stocks distribution shifts, fish health, stock productivity, habitats, regime shifts in ecosystems and altered growth, reproduction rates, seafood safety and overall changes in the ecosystem production potential.
- Investigate the impact of fishing vessels and activities – including upstream (e.g., fishing vessels engines and fuel, gear design and manufacturing) and downstream (e.g., seafood processing) – to climate change, and develop innovative solutions to minimize those impacts.
- Build, among others, on the work of H2020 projects ClimeFish and CERES and provide applicable approaches and tools to the fishing sector.
- Build, among others, on the work of the EMFF 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*”.

- Build synergies with the topic on Bycatch in Destination “Biodiversity and ecosystem services”.

HORIZON-CL6-2024-FARM2FORK: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

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

- Enable sustainable aquaculture systems for fair, 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*”²⁰, and the “*Action plan for the development of organic production*”²¹;
- Implementation of innovations, such as dietary shifts and aspects of circularity, for a more sustainable and competitive EU aquaculture enhancing aquaculture resilience to climate change adverse consequences;
- Position EU aquaculture production as the global reference for sustainability and quality, reduce our dependence on seafood imports and create more jobs, especially in rural and coastal regions;
- Contribution to aquaculture production with a reduced environmental footprint, advancing towards climate-neutrality;
- Aquaculture production fully embedded in natural, social and economic sustainability.

²⁰ COM(2021)236 final

²¹ COM(2021)141 final

Scope:

Proposals are expected to:

- Enhance knowledge of the impacts of climate change on aquaculture production at environmental, social and economic levels.
- Identify, forecast and assess the main effects of climate change on aquaculture production and potential adaptive measures to be implemented.
- The impacts of climate change to be considered will include 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, and expansion of diseases (e.g. including photobacteriosis for farmed seabass in the Mediterranean), invasive species, and other climate related risks.
- Adaptation and mitigation solutions and opportunities to be investigated will include technological, social, economic, and biological/ecological aspects, such as selection of suitable sites, culture methods (including the contribution of organic production), species plasticity and adaptability to changing environments, breeding and selection techniques for a more sustainable, productive and resilient production.
- Aspects of circularity will have to be addressed in terms of more efficient use of resources and less negative impacts on marine environment, including reduction, valorisation, and reuse of waste.
- Build, among others, on the work of H2020 and EMFF projects, such as ClimeFish and CERES, and provide applicable approaches and tools to the aquaculture sector.

Heading 3 – Transforming food systems for health, sustainability and inclusion

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

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

<i>Legal and financial set-up of the Grant Agreement</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. 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 XX threshold provided for in Article 204(a) of the Financial Regulation No 2018/1046102 does not apply. The maximum amount to be granted to each third party is EUR XX for the whole duration of Horizon Europe
<i>Total indicative budget</i>	<i>The total indicative budget for the duration of the partnership is EUR XX million.</i>

HORIZON-CL6-2023-FARM2FORK: 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 XX 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 XX 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: In line with the European Green Deal priorities, the farm to fork strategy in particular the Contingency plan for ensuring food supply and food security, healthy and environment-friendly food system, and the EU’s climate ambition for 2030 and 2050, the successful proposal will support R&I to foster resilient European food systems in a changing world.

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

- Better understanding of the short- and long-term drivers of change that affect food systems.
- Better understanding of the vulnerabilities, dependencies and critical infrastructure of the food systems.
- Informed policies and business strategies aimed at enhancing resilience of food systems.
- Improved preparedness by making use of available data (including on weather, climate, and markets).
- Enhanced resilience of food supply and ensured food security in a changing world.

Scope:

Proposals should cover all of the following aspects:

- Improve foresight and establish an observatory for the main socio-economic and environmental drivers of change, including short-term shocks and long-term stresses, to which the food systems were/are/might be exposed.
- Improve exploratory modelling and capacity for managing deep uncertainties.
- Analyse vulnerabilities, dependencies and critical infrastructure of the food systems from diversity of perspectives.
- 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 what are the leverage points for reducing the risks and improving the capacity to deal with drivers of change.
- Develop recommendations for strategies and best practices what can policymakers, businesses, civil society, scientists, teachers, and other environmental and food system operators do through policy, research, education, community action, or other means to enhance resilience of the food systems.
- Complementary to the first topic on resilient farming from WP21-22.

HORIZON-CL6-2023-FARM2FORK: 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 XX 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 XX 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:</p> <p>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 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 eradicate micronutrient deficiencies in the EU. 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 reduce nutrition inequalities in eradicating micronutrient deficiencies in EU at different levels (e.g. countries, regions, urban/rural areas) and for different communities of vulnerable groups such as infants, elderly, pregnant women, people with intolerances/allergies, people with metabolic disorders on the one hand, migrants and low income groups on the other hand.

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

- Development of specific micronutrients biomarkers to facilitate screening of high risk population/individuals and to identify the optimal intervention and improved knowledge of the true prevalence of micronutrient deficiencies across EU.
- Better understanding of micronutrient functionality and metabolism of micronutrients during critical periods of life.
- Better understanding of the specific mechanisms during food digestion and micronutrient metabolism that delivers the desired health effects in the above-described particular cases.
- Development of new integrated and efficient solutions/strategies/programmes aiming at eradicating micronutrient deficiencies at a general level and, in particular in the vulnerable population groups across EU in shifting towards healthier diet. Such solutions/strategies/programmes need to be aligned with relevant national and EU food and health laws and policies.

Scope:

Proposals are expected to address all of the following R&I activities:

- Develop specific micronutrient biomarkers to facilitate screening of high-risk population/individuals and to identify the optimal intervention.
- Map and monitor the specific vulnerable groups suffering of micronutrient deficiencies at national/regional/rural/urban levels for different socio-economic and cultural groups in EU to determine the true prevalence of the micronutrient deficiencies.
- Develop standardized methods 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 mechanisms to policy makers to monitor their progress.
- Increase the utilization of big data and artificial intelligence to elucidate the complex links between micronutrients, diets, health and development of diseases.
- Identify their specific needs for optimal health/development (e.g. growth, neuro-cognitive development, immune system, physical performance) and identify the root cause and the severity of the micronutrient deficiencies.
- Relevant advice of EFSA has to be taken into account.
- Better understand 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, interaction with other ingredients/nutrients) to enable to incorporate micronutrients in food products in order to be taken efficiently and have the desired health effects in the above-described particular cases (when there is no other way to achieve nutritional adequacy by selecting and preparing foods that are naturally good sources of deficient micronutrients).
- For the most vulnerable groups, develop innovative products/solutions/strategies /programme through integrated food-based approach instead of supplementation and fortification (e.g. fresh and diversified food naturally rich in (micro)nutrients which are currently under-consumed including old/neglected fruit and vegetable crops, biofortified crops, minimally processed and reformulated food products) for different countries, regions, urban and rural areas and for different communities to eradicate micronutrients deficiencies and evaluate their effective impact. Such products/solutions/strategies/programmes need to be coherent with relevant national and EU food law and policy. National food based dietary advice and policies on health and dietary intakes of EU Member States, also for the specific vulnerable groups addressed, need to be respected.
- Develop innovative and effective tools to improve education, communication and training (e.g. cooking classes) on healthy nutrition and diets adapted to various socio-

economic groups of the populations in respect of cultures, ages, gender needs that could be considered for implementation by policy makers.

- 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 deficiencies program to eradicate micronutrients deficiencies in the EU. Provide evidence in the form of a cost/benefit analysis of the proposed measures and the costs of not acting.

HORIZON-CL6-2024-FARM2FORK: 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 XX 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 XX 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: 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 and organic production systems that optimize nutritional, structural and functional food properties of raw materials to enhance health and well-being benefits of EU citizens, to improve nutrition status, to reduce food production costs and with low impact on the environment/climate. 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.

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

- New knowledge that food industry can use in the design of the new healthy, natural, minimally processed and sustainable food products and processes to improve health and well-being of EU citizens and with low impact on the environment/climate.

- Alignment in goals of consumers and food solution providers for more healthy, natural, tasty, minimally processed, affordable and sustainable source food.
- New market and job opportunities for food SMEs and industries.

Scope:

Proposals are expected to address the following:

- Develop and optimise new methods/processes with low 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.
- Develop new healthy, natural, tasty, minimally processed, sustainable and affordable food products and assess their nutritional, structural, sensorial and functional properties to enhance health and well-being, to improve nutrition status and to reduce costs with low impact on the environment (e.g. reformulation of food products with less salt, sugar, saturated and trans fats and additives, less red and processed meat, more plant based with more fruits, vegetables, nuts, seeds high in fibre and bioactive compounds).
- Investigate, assess and develop improved predictive models for effects (risks/benefits) of food ingredients and mixture of them on consumer health.
- Study and optimise the role of 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 NCDs.
- Where relevant demonstrate the safety in accordance with relevant EU regulatory frameworks related to their placing on the market, and generate data to enable registration of less toxic alternatives.
- Ensure societal acceptance of new food products and processes.

HORIZON-CL6-2023-FARM2FORK: Traceability strategies and detection methods on products derived from new genomic techniques to enable safe innovation in the food system

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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 Joint Research Centre (JRC) may participate as member of the consortium selected for funding.</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. The farm to fork strategy aims to accelerate the transition to sustainable farming and food systems. One of the strategy's main priorities is to ensure traceability and authenticity, enhance transparency and enable safe innovation along the food supply chain. The successful proposals should therefore contributing to enabling the enforcement of the Genetically Modified Organisms (GMO) legislation, ensuring traceability and authenticity, enhancing transparency and promoting safe innovation of food products.

Although existing detection methods may be able to detect even small alterations in the genome, this does not necessarily confirm the presence of a regulated product as the same alteration 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 these techniques do not contain screening targets (e.g. promoters /terminators) 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 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. 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 policy implementation and enforcement challenges in the context of the current GMO legislation.
- 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
- Enable informed consumer choices by enhancing transparency and traceability across food chain
- Enable safe 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 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. The methods should be able to distinguish between identical mutations obtained through different techniques
- Development and validation of reliable detection methods for the proper implementation of the current EU legislation, relevant for the purposes of import and EU market controls, consumer information, and coexistence of different forms of agriculture. 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.
- The proposal could also focus on the detection of unwanted insertions (foreign DNA, CRISPR-Cas sequences, etc) or off-target mutations.

Proposals are also encouraged to cooperate with actors working on related initiatives, and could foresee the involvement of the EU Joint Research Center and/or members of the European Network of GMO Laboratories (ENGL), which provides expertise in food science, authenticity and quality of food supplied in the EU.

Proposals have to start from a Technology Readiness Level (TRL) of at least 2 and achieve at least level 4. Proposals should define clearly the TRL starting point and the plan to reach more advanced TRL.

International cooperation is encouraged.

HORIZON-CL6-2023-FARM2FORK: 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 XX 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 XX 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:

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 practitioners (official control authorities, food business operators, etc.). Innovative ideas from practice are also insufficiently captured, exchanged and spread. Food safety knowledge and innovation systems are also insufficiently connected.

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

- Widespread use of new knowledge and innovative solutions by practitioners on the ground ensuring food safety ;
- Improved flow of knowledge and innovation between academia and practitioners through more dynamic interactions, and between Member States, to ensure food safety in the food supply chain ;
- Better incorporation of the needs of end-users (official control authorities, food business operators, etc.) into research and innovation communities, which would generate a better targeted and shared research agenda for innovation-driven research, including the multi-actor approach ;
- Greater user acceptance and adoption of collected solutions ;
- Improved skills and long-term available training and education material for end-users on how to ensure food safety.

Scope: Proposals are expected to contribute to the elaboration of a thematic network in the area of food safety, including the following activities:

- Development of a community of practice to foster knowledge exchange between end-users, research and innovation ecosystems, who will work together to develop, debate, collect and communicate new knowledge, innovative solutions and best practices for food safety (for food and feed products as well as for novel practices and technologies). Traditional and local food products should be taken into consideration in this community of practice.
- Collection and provision, through the main existing dissemination channels most used by practitioners, of easily accessible practice-oriented knowledge on the area so that the material (including material for training and educational purposes) remains available in the long-term;
- Elaboration of tailor-made communication materials summarizing, sharing and presenting, in a language easily understandable for end-users, existing best practices and research results that are near to be put into practice, but not sufficiently known by practitioners;
- Identification of possible linkages and synergies with other networks, initiatives and policy instruments at regional, national and European level, that could help disseminate knowledge and results;
- Dissemination of results via public events, publication of case studies, practice abstracts, research papers, reports, videos and other documents targeted.

HORIZON-CL6-2024-FARM2FORK: Climate change and food safety: effects of climate change on food safety hazards across food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:

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.

Projects 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 system actors from farm to fork.
- Identification, development and widespread dissemination of mitigation measures to reduce/prevent climate change-related food safety risks (individual and cumulative risks).

Scope: Proposals should cover all of the following aspects:

- Anticipate how climate change may affect food safety in Europe and in particular by increasing the potential for the emergence/re-emergence of new hazards.
- Monitor the impact of climate change on food safety across food systems, and how climate change could impact risk assessment methodologies, to understand how risk assessment methodologies may need to evolve to meet new challenges.
- Analyse the effect of climate change and its impact with respect to:
 - existing food safety hazards throughout the entire food supply chain (from farm to fork),
 - risk factors including the appearance of (re)emerging hazards.
- European regions should participate as "demonstrators" facilitating research and innovation under different climate conditions.
- Projects should address policy needs and priorities, in particular regulatory control and enforcement aspects in the food safety area.

The European Food Safety Authority should be engaged as part of the future action.

HORIZON-CL6-2024-FARM2FORK: 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 XX 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 XX 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 Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

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.

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

- Improved flow of knowledge and innovation between academia and practitioners through more dynamic interactions, and between Member States authorities, to tackle fraudulent practices in the food supply chain ;
- Better incorporation of the needs of end-users (official control authorities, food business operators, service providers, etc.) into research and innovation communities, which would generate a better targeted and shared research agenda for innovation-driven research, including the multi-actor approach ;

Scope: Proposals are expected to contribute to the elaboration of a thematic network in the area of food fraud, including the following activities:

- Development of a community of practice to foster knowledge exchange between end-users, research and innovation ecosystems, who will work together to develop, debate, collect and communicate new knowledge, innovative solutions and best practices

Projects 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.

HORIZON-CL6-2024-FARM2FORK: Creating smart and attractive tools to enhance healthy and sustainable diets at home

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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: 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 transforming food systems so that they can deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. The EU’s farm to fork strategy states that: “European diets are not in line with national dietary recommendations, and the ‘food environment’ 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 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 the following expected outcome:

- Develop tools that can support empowered citizens to make healthy and sustainable cooking the easiest choice

Scope:

Proposals are expected to address the following:

- Developing tools and applications that enhance citizens to have a healthy and sustainable diet at home and that can be considered by national policy makers and private actors
- Linking food waste and to the need to reduce household wastes 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
- Taking a holistic approach, e.g. delivering green produce including transport aspects, sustainable packaging, and recycling/composting
- Exploring possibilities to connect with sustainability aspects of delivery services (prepared meals, micro deliveries)
- Including in approaches ‘culinary culture dimension’ such as based on nationality, religion, culture, regionality and seasonality etc., and time and financial constraints and ensure that national nutritional policies and advice are respected
- Applying social innovation for inclusive and long-term solutions

HORIZON-CL6-2024-FARM2FORK: 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 XX 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 XX 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:

	<p>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 Joint Research Centre (JRC) may participate as member of the consortium selected for funding</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 environmentally friendly food system, as well as of the EU's Climate ambition for 2030 and 2050. This will contribute to transforming food systems so that they can deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses.

Citizen science²² can allow for enhanced food system transformation driven by engagement, trust and transparency. It can leverage private relevant data to take stock of current consumers' behavior towards the food system, including aspects such as food consumption, health, mobility, regionality/locality, food-related waste generation and management, etc.

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

- Use citizens science to understand consumer food consumption behaviour, the factors affecting choices and drivers that would facilitate changes in consumer behaviour towards healthy and sustainable food consumption practices.

Scope:

Proposals are expected to address the following:

- Exploring the potential of 'citizens science' in the food systems domain linked to data and technology to ensure inclusive solutions
- Developing and testing tools by using data and technology to enhance uptake of healthy and sustainable diets and foster sustainable food system transformation
- Identifying challenges and drivers of citizens to share data
- Analysing how consumer data can be shared in an anonymized and safe way complying with GDPR
- Exploring which data type to share (behavioural data, data from private providers, such as relevant apps, stated data...etc.), how to meaningfully harmonize data and how to use it for food system transformation by different actors.

²² **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)

Where relevant, establish synergies with the Data Space for smart communities²³ and make use of open standards and technical specifications, for example the Minimum Interoperability Mechanisms (MIMs Plus).

HORIZON-CL6-2023-FARM2FORK: Cultured meat and seafood – state of play and future prospects in the EU from social, environmental, economic and ethical point of views

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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 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, 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.

The objective of this topic is to develop knowledge on this subject on sustainability aspects (e.g. environmental, economic, and social). It does not aim to help developing the market of cultured meat and seafood in Europe.

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

- Provide complete and up-to-date knowledge to food system actors on environmental, economic and social (including on ethics, safety and nutrition) aspects of cultured meat and seafood.

²³ See Digital Europe Work Programme 2021-2022, topic 2.2.1.2

- Provide additional knowledge on potential challenges and opportunities from cultured meat and seafood to reduce greenhouse gas (GHG) emissions, air, water and soil pollution and impact on ecosystems, generation of household wastes.

Scope:

Proposals are expected to address the following:

- Study the social aspects related to cultured meat and seafood: including the consumers' perception on cultured meat and seafood, animal welfare, religious and ethical aspects, etc.
- Study the economic aspects: including how to reduce the high infrastructure costs and scaling up in a cost-effective way; and the “cost of inaction” (economic impact of not having such investments in the EU).
- Study the environmental aspects: considering the EU methodology of the Product Environmental Footprint, and including the carbon footprint, pollution, impacts on biodiversity, resource use, how the released land from livestock production could be utilised, etc. and develop a comparison of the overall environmental impact of cultured meat/seafood vs. conventional meat/seafood. Livestock co-products, such as leather, pet food, cosmetics, fertilisers, other chemicals, etc., should also be considered, as well as packaging issues.
- Identify, explore and study scenarios of market penetration and consumer acceptance of cultured meat and seafood and conduct LCA analysis to assess the environmental and sustainability impact/benefits each scenario would result in.
- Explore the current and possible future impacts for the farmers, including economic viability and likely to be accepted options for reconversion of farmers, challenges and opportunities for the farming sectors, etc.
- Assess to what extent the proposal contributes to the farm to fork objectives, as well as related risks and trade-offs, and delivers 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 (e.g. meeting the needs, values and expectations of society in a responsible and ethical way);
- Involve a multi-disciplinary consortium of independent researchers that will organize conferences and meetings gathering a wide range of food system actors. Proposals should also promote international cooperation. Where relevant, activities should build and expand on the results of past and ongoing research projects (e.g. Meat4all, CCMeat). 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: Impact of 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 XX 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 XX 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: 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.

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

- Have a clear picture of what the development of novel food (e.g. insect protein, algae-based products) could mean especially for conventional farming systems (e.g. economic and social).
- Provide solutions that can help achieving the objectives of the Green Deal (e.g. climate change, biodiversity and ecosystem services, zero pollution, circularity, people’s health and wellbeing, nutrition).

Scope:

Proposals are expected to address the following:

- Identify novel foods that have the highest potential in terms of market development taking into account the Farm to Fork Strategy objectives. One of them should be insect-based.
- Assess their economic impact (e.g. price, production cost, share of market, etc.) and assess the impact such development will have on other sectors, especially conventional food.
- Assess their social impact (e.g., consumer acceptance including considering gender and age aspects).
- Assess their potential to address the most relevant Green Deal objectives.
- Assess to what extent the proposal contributes to the farm to fork objectives, as well as related risks and trade-offs, and delivers 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 (e.g. meeting the needs, values and expectations of society in a responsible and ethical way);
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.
- Proposals should also promote international cooperation.
- Where relevant, activities should build and expand on the results of past and ongoing research projects. 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-CL6-2023-FARM2FORK: Optimising marketing standards at retail_and consumption level to prevent/reduce food waste

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</p>
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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 proposal will support R&I to prevent and reduce food loss and waste, 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 the empowerment of communities.

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

- Better understanding of the impact of marketing standards on the generation of food waste at retail and consumption level and for various commodities.
- Better understanding of the impact of marketing standards on the generation of plastic waste due to food packaging made of plastic.
- Improved awareness of consumers on the impact of marketing standards on their food choices and the sustainability of these choices.
- Improved market access to food products that would otherwise be wasted.

Scope:

Proposals must address the following points:

- Assess how marketing standards affect the level of food waste generation, whether it is EU marketing standards, international marketing standards or private marketing standards.
- Explore how the stringency level of marketing standards affect food waste generation, by assessing the balance between costs and benefits.
- Develop tools and methods to raise awareness amongst consumers on how marketing standards can affect their perception of food products and thus generate behaviours that lead to more or less food waste.
- Provide a set of recommendations to regulators, food businesses and private owners of marketing standards to help them design marketing standards or adapt the current ones in order to prevent food waste and plastic waste in the food chain.

- Investigate to which extent marketing standards could be modified/adapted to prevent food waste and plastic waste at retail/consumption level, including by creating or further developing alternative marketing channels, increased visibility of food still safe to eat but that would otherwise be discarded, also in cases of market disruptions that require a level of responsiveness and that could lead to a higher amount of food waste.
- Identify alternative marketing channels or models already in place for European macro or micro regions with similar products (transnational angle), and promote the most promising interventions and good practices. Creating alternative markets should not lead to an increase in food waste streams to be used in these markets.

The proposal activities must be performed for various commodities, with a stronger focus on fruits, vegetables, cereals, fish, meat and eggs.

Successful proposals must deliver on food waste and plastic waste reduction and prevention across the food system. They must explain how they will deliver co-benefits to the Food 2030 priorities (nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, and innovation and empowerment of communities).

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. Special attention should be paid to the young generation.

HORIZON-CL6-2024-FARM2FORK: Preventing and reducing food loss and waste to help reach 2030 climate targets

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>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 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 proposal will support R&I to prevent and reduce food loss and waste, 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 the empowerment of communities.

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

- Reliable data on the amount of greenhouse gas emissions related to food loss and waste, at EU and Member state level.
- Better understanding on how food loss and waste prevention/reduction actions can contribute to climate targets.
- Integration of actions related to food loss and waste prevention/reduction into emission reduction instruments and into national energy and climate plans.

Scope:

Proposals must address the following points:

- Provide reliable quantitative data on how food loss and waste prevention/reduction could impact the reduction of greenhouse gas emissions in the EU, for all Member states. Potential double counting of avoided emissions should be analysed.
- Carry out mapping activities of relevant emission reduction and funding instruments in which food loss and waste prevention/reduction could be well integrated.
- Establish a set of recommendations on data and measures on food loss and waste prevention/reduction that could be taken into account in NECPs.
- Successful proposals must deliver on food waste reduction and prevention across the food system. They must explain how they will deliver co-benefits to the Food 2030 priorities (nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, and innovation and empowerment of communities).
- Proposals must build on past or ongoing EU-funded research and collaborate with relevant initiatives, including the Commission's Platform for Food Losses and Waste. They must set out a clear plan on how they will cluster with other proposals selected 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 must also be grouped and coordinated in a complementary manner. Applicants should plan the necessary budget to cover these activities.

HORIZON-CL6-2023-FARM2FORK: 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 XX 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 XX 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:</p> <p>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>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</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 microorganisms for safer, healthier and more environmentally friendly food processing. 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.

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

- Applicable business solutions anticipate, prevent and reduce food loss and waste due to spoilage or microbial contamination during food processing (and its environment), packaging, storage (and use of date marking) and transportation.
- Develop an evidence based robust and responsive policy framework for microbiome control in the food system.

Scope:

Projects need to aim for a holistic approach to realize the full potential of the impact that microbiome innovation have to address food, health, environmental issues and related economic problems and opportunities in order to extend food shelf life.

Projects should be stimulated to use a systems approach and to work inter-disciplinarily and trans-disciplinarily to understand the role of microbiomes in different ecosystems and assess how microbiomes are inter-connected.

Proposals are expected to address the following:

- Microbiome as an indicator of unexpected contaminants or environmental changes in food (packaging)
- Applicable microbiome business solutions in food packaging and targeting spoilage microorganisms in perishable foods to extend shelf life (shelf life)
- Limiting microbial growth in drinking water used in food production (water for food production = food ; ref: Drinking Water Directive)
- Develop, test and evaluate approaches that combine metagenomic sequencing data with data on associated factors, consumer preferences and machine learning to dynamically predict shelf life
- Develop models and tools for controlling and predicting shelf life and risk of foodborne infection for improved decision making
- Proposals should explain how they will deliver co-benefits to the four Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowerment of communities as well as those relevant to different socio-economic and cultural groups.
- Where relevant demonstrate the safety in accordance with relevant EU regulatory frameworks related to their placing on the market.
- Proposals must implement the multi-actor approach by involving a wide diversity of food system actors and conducting inter- and trans-disciplinary research engaging consumers, consumer organizations and civil society organisations and including local and indigenous knowledge of soils. Proposals are encouraged to build on past or ongoing EU-funded research, research infrastructures and collaborate with relevant initiatives, including the Missions. International cooperation (such as the International Bioeconomy Forum) is highly recommended. Proposals should include a clear plan on how they will collaborate with other proposals selected under this and any other relevant topic, by participating in joint activities, workshops, as well as common communication and dissemination activities. Proposals should plan the necessary budget to cover these activities.

HORIZON-CL6-2024-FARM2FORK: Microbiome as a flavour and 3rd pillar in the alternative protein of food industry

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>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>International organisations with headquarters in a Member State or associated country are exceptionally eligible for funding.</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 microorganisms for safer, healthier and more environmentally friendly food industry. 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.

Projects results are expected to contribute to the following expected outcome:

- Applicable business solutions in new precision fermentation/ post-fermentation techniques for alternative proteins

Scope: Need for a holistic approach to realize the full potential of the impact that microbiome innovation have to address food, human and animal health, environmental issues. Projects should be stimulated to use a systems approach and to work inter-disciplinarily and trans-disciplinarily to understand the role of microbiomes in different ecosystems and assess how microbiomes are inter-connected.

Proposals are expected to address the following:

- Develop bioinformatics prediction of smell and taste of microbes to create new nuances and flavours in cooperation with chefs/restaurants
- Provide new precision fermentation/ post-fermentation techniques for alternative proteins

- Development of new microbial biomasses that can be a source of nutrients for humans (proteins, sugars).
- Where relevant demonstrate the safety in accordance with relevant EU regulatory frameworks related to their 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 should explain how they will deliver co-benefits to the four Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowerment of communities as well as those relevant to different socio-economic and cultural groups.
- Proposals must implement the multi-actor approach by involving a wide diversity of food system actors and conducting inter- and trans-disciplinary research engaging consumers, consumer organizations and civil society organisations and including local and indigenous knowledge of soils. Proposals are encouraged to build on past or ongoing EU-funded research linked to alternative proteins, research infrastructures and collaborate with relevant initiatives, including the Missions. International cooperation (such as the International Bioeconomy Forum) is highly recommended. Proposals should include a clear plan on how they will collaborate with other proposals selected under this and any other relevant topic, by participating in joint activities, workshops, as well as common communication and dissemination activities. Proposals should plan the necessary budget to cover these activities.

Heading 4 – Targeted international cooperation

HORIZON-CL6-2023-FARM2FORK: EU-AU cooperation – linking FNSSA and PANAP activities

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:

	<p>The following additional eligibility criteria apply:</p> <p>At least 3 partners from Africa</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding</p>
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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 first priority of 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, as well as the joint EU-AU Innovation Agenda.

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

- Improved alignment of activities in the scope of EU-AU cooperation, supporting the implementation of the FNSSA 10 years' roadmap, providing end users with co-benefits in terms of policies supporting food and nutrition security and sustainable agriculture.
- Provide opportunities for exchange in agricultural policy development and related studies between Europe and Africa
- Support African agricultural policy makers with scientific advice and dedicated analysis of agricultural policies impact on the agri-food sector and rural areas.

Scope:

Proposals are expected to address the following:

- Reinforce capacity building by aligning European and African training programmes, including through exchange opportunities and networking with EU - AU partners;
- Activities will support current and future activities under the PANAP network ensuring synergies and complementarities with the FNSSA working group
- Provide methodologies and strategies to value the scientific support to policy development in Africa and in Europe
- Contribute to capacity building for policy development

HORIZON-CL6-2023-FARM2FORK: Long-term sustainable platform for the EU-AU cooperation under the FNSSA partnership

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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: At least 5 partners from Africa The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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 first priority of 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, as well as the joint EU-AU Innovation Agenda.

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

- Support the establishment of a long-term sustainable platform for the 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
- Better coordination of research activities and investments in food nutrition security and sustainable agriculture avoiding duplication of efforts

Scope:

Proposals are expected to address the following:

- Build on the work done by the Horizon 2020 LEAP4FNSSA, selected proposal should provide the necessary support for the activities of the International Research Consortium. Building a formal research cooperation between EU and international partners on Food nutrition security and sustainable agriculture, supporting the implementation of the FNSSA 10-year roadmap.

- Contribute with a sound methodology to the analysis of results of on-going R&I and knowledge sharing through a single online knowledge platform with access to information and data from the existing data base developed under the Horizon 2020 LEAP4FNSSA project;
- Support to update the FNSSA roadmap with new R&I priorities based on identified knowledge gaps as well as identifying and developing joint flagship initiatives.

HORIZON-CL6-2024-FARM2FORK: Agro-forestry 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 XX 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 XX 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:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding</p> <p>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 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 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, and its first priority on Food and Nutrition Security and Sustainable Agriculture, as well as the joint EU-AU Innovation Agenda as well as the joint EU-AU Innovation Agenda.

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

- Improved qualitative and quantitative data availability of the contribution of agroforestry to climate change (mitigation and adaptation), and sustainable agriculture
- Improved management of agroforestry systems, including systems involving animal production in Africa;
- Enhance capacities to value the socioeconomic and environmental performance of agroforestry for climate change resilience.
- Strengthen agroforestry innovation ecosystem for better user acceptance and implementation of agroforestry in the EU and Africa

Scope:

- Identify the most suitable species to be used in agro-forestry for different geographic regions in Africa, generating sustainable ecosystems with impact on local communities, and on women, looking for models where this impact is greater.
- Assess the potential of carbon farming as a future business for farmers and foresters and could potentially lead the land sector to the climate-neutrality in some decades.
- Identify the structural needs to agro-forestry crops in different geographical regions, including the analysis of production burdens, suggest solutions and address traceability of all steps in the production chain to measure the effectiveness of solutions
- Support this new value chain with sound science and capacity building to be efficient, fair, and easily adopted by the landowners and farmers.
- Establish local pilots
- Mainstreaming carbon farming and sustainable forest management

HORIZON-CL6-2023-FARM2FORK: Support to the agro-ecological markets and trade under the FNSSA partnership

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The following exceptions apply:

	<p>The following additional eligibility criteria apply:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding</p> <p>The proposals must use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.</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 climate objectives 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, and its first priority on Food and Nutrition Security and Sustainable Agriculture, as well as the joint EU-AU Innovation Agenda.

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

- Improved assessment systems for agro-ecological food systems with co-benefits for producers, climate and citizens,
- Assessment of certification schemes, testing innovative solutions with agro-food systems/certification actors, like agricultural trade, Ministries in charge, border regime management (digital solutions)
- Contribution to the joint EU-AU Innovation Agenda

Scope:

- Increased competitiveness of the agro-ecological production for food with improved quality and transparency in local, regional and international markets
- Support training, and capacity building for actors in agro-ecological business trade
- Organise demonstration and networking events with relevant actors of the food chain from producers to final users, including relevant administrations for promoting agro-ecological products.
- Implement the new technologies, including IoT and AI to bring transparency to the agro-ecology value chain.

HORIZON-CL6-2024-FARM2FORK: Setting up living laboratories in Africa

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>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:

- Activities will link to those of the ‘A soil deal for Europe’ contributing to ensure healthy soils in Africa
- Creation of an African network of living laboratories as real-life testing sites for experimentation, demonstration and upscaling of solutions.
- New opportunities for new or improved business models in primary production
- Contribution to the joint EU-AU Innovation Agenda

HORIZON-CL6-2024-FARM2FORK: Earth observation for sustainable African food systems in view of climate change

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>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 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 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, and its first priority on Food and Nutrition Security and Sustainable Agriculture.

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

- Improved earth observation supported assessment systems with co-benefits for producers, climate and citizens, and in particular food security in view of climate change.
- Provide solutions to better food security relevant data coverage of the African continent.

Scope:

Proposals are expected to address the following:

- Study the gaps and building blocks of better earth observation systems based on projects such as SEACRIFOG and AFRICULTURES.
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.

HORIZON-CL6-2023-FARM2FORK: EU-African Union – 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 XX 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 XX 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:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>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 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, the successful proposal will contribute to the first priority of 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.

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

- Improved assessment systems with co-benefits for producers, climate and citizens, assessment of certification schemes, testing innovative solutions with food systems/certification actors,
- 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 and social impacts of food supply (organic and conventional)
- Clearly explain how the proposal will contribute towards scaling-up of business models of climate-neutral fair and just food supply

- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.

HORIZON-CL6-202X-FARM2FORK: EU-Africa Union – food safety

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>At least 3 partners from Africa and at least 2 from the same region as defined by the African Union</p> <p>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 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, and its first priority on Food and Nutrition Security and Sustainable Agriculture.

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

- Improved African food safety systems,
- Building blocks for improved food safety Africa, reducing mycotoxins, enhancing local markets and regional trade.

Scope:

Proposals are expected to address the following:

- Study the gaps and building blocks of better earth observation systems based on projects such as SEACRIFOG and AFRICULTURES
- Implement the multi-actor approach by involving a wide range of food system actors and conducting inter-disciplinary research.

DRAFT

Destination – Circular economy and bioeconomy sectors

This destination and its topics target climate-neutral, zero pollution²⁴, circular and bioeconomy transitions²⁵, covering safe, integrated circular solutions at territorial and sectoral levels, for important material flows and product value chains, such as the textile, electronics, pharmaceuticals, chemicals packaging, tourism, plastics and construction sectors, as well as key bioeconomy sectors such as sustainable bio-based systems²⁶, sustainable forestry, small-scale rural bio-based solutions, environmental services and aquatic (including marine and freshwater) value chains²⁷.

The destination supports the European Green Deal, and in particular:

- The new EU circular economy action plan, adopted in March 2020, and the subsequent initiatives along the entire life cycle of products²⁸.
- The EU Strategy on Adaptation to Climate Change adopted in February 2021.
- The EU zero pollution action plan, adopted in May 2021, with the Chemicals Strategy for Sustainability from October 2020 and the New Approach for a Sustainable Blue Economy adopted in May 2021.
- The EU forest strategy for 2030: research and innovation will be key drivers in achieving the ambitious goals of this strategy.

²⁴ See also Destination 4 ‘Clean environment and Zero pollution’ of Cluster 6.

²⁵ With synergy ensured with Horizon Europe Clusters 4 and 5 (including their European Public Private Partnerships), whereas Cluster 4 targets industrial dimension (including digitalisation and circular and climate-neutral / low GHGs emissions industry, including developing bio-integrated manufacturing), and Cluster 5 covers cost-efficient, net zero-GHG energy systems, centred on renewables (including R&D necessary to reduce CO₂ emissions from the power and energy-intensive industry sector, solutions for capturing, utilisation and storage of CO₂ (CCUS), and bioenergy/biofuels and other industrial sectors), while Cluster 6 covers the research and innovation based on sustainable biological resources (bioeconomy sectors), in particular for new sustainable feedstock development and through the development of integrated bio-refineries).

²⁶ With synergy and complementarity with the EU partnership on ‘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 first CBE calls expected in 2022).

²⁷ With 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’.

²⁸ 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 aims also at ensuring that the circular economy works for people, regions and cities, fully contributes to climate-neutrality and zero pollution, resource use decoupling and harnessing the potential of research, innovation and digitalisation

- The EU climate law targeting climate-neutrality by 2050 and AFOLU²⁹ climate-neutrality by 2035 supports enhanced focus on bio-based circular consumption, as part of the Fit for 55 package proposed on 14 July 2021³⁰.
- The new European Bauhaus initiative³¹ and Renovation Wave³².

Furthermore, the work-programme for 2023-2024 of Horizon Europe will play a critical role in the implementation of the upcoming EU strategy for sustainable textiles³³, which will highlight the strategic role of Horizon Europe initiatives on research and innovation for the textile ecosystem. The strategy will be complemented by the transition pathway for the ecosystem which will implement the framework established in the strategy. The future sustainable product initiative will set out requirements on design for improving the environmental footprint of products striving for products to be kept in circular uses for as long as possible. In this regard, the production of sustainable recyclable fibres will be critical. Moreover, with the adoption of more restrictions on production and use of hazardous chemicals, in for example textiles for clothing, (e.g. restrictions under REACH, possible measures on the releases of persistent pollutants, such as micro- and nanoplastics) and the shortage of such chemicals in the long-term, R&I activities will be critical to support and ensure sufficient sustainable materials supply for the EU textiles industry.

The wide range of EU initiatives supported by this destination include also the industrial strategy, EU chemicals strategy for sustainability, SMEs strategy, the revised (2018) Bioeconomy strategy, the communication on sustainable carbon cycles, sustainable blue economy and its offshoot initiatives, biodiversity strategy 2030, farm to fork strategy, upcoming EU agenda for tourism, plastics strategy and the action plan on critical raw materials. In addition, this destination will contribute to the transition pathways of the energy intensive industries, textiles, construction and agri-food industrial ecosystems.

Expected impact

Proposals for topics under this destination should set out a credible pathway to developing circular economy and bioeconomy sectors, achieving sustainable and circular management and use of natural resources, as well as prevention and removal of pollution, unlocking the full

²⁹ Agriculture, Forestry and Other Land Use

³⁰ COM(2021) 550 final “Fit for 55’: delivering the EU’s 2030 Climate Target on the way to climate neutrality”

³¹ COM(2021) 573 final “New European Bauhaus Beautiful, Sustainable, Together”

³² COM(2020) 662 final “A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives”

³³ Textiles is one of the key material streams in the circular economy action plan. The whole textile value chain has an enormous environmental footprint and an equal potential for improvement through circularity measures. Attention should be given to a circular, safe and sustainable design and the use of new sustainable biobased materials, but also 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 green and digital transition, resilience and competitiveness. The upcoming EU Strategy for Sustainable Textiles will highlight the strategic role of Horizon Europe for the textile ecosystem. The Sustainable Product Initiative will set out design requirements in order to extend the lifetime of products, which makes the production of sustainable fibres critical. Moreover, the adoption of more restrictions on production and use of chemicals in textile, clothing, leather and footwear, e.g. under REACH, and measures against microplastics release, will create additional R&I needs.

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

- **Accelerate regional, rural, local/urban and consumer-based transitions** towards a sustainable, regenerative, inclusive, just and clean circular economy and bioeconomy across all regions of Europe, with special attention to the most sensitive/vulnerable regions, based on **enhanced knowledge and understanding of science**, to design, implement and monitor policies and instruments for circular and bio-based transitions.
- **Enhance European industrial sustainability, competitiveness and resource independence** by lowering the use of primary non-renewable raw materials and reducing emissions of greenhouse gases and other pollutants, achieving an improved environmental footprint (including on biodiversity), enabling climate-neutrality, zero pollution³⁴ and higher resource efficiency. This will be supported by increasing circular practices in textiles, plastics, electronics and construction, developing industrial symbiosis and circularity by design, cascading use of biomass, clean secondary raw materials, along and across value chains.
- **Develop innovative and sustainable value-chains in the bio-based sectors** substituting fossil-based ones, increasing circular bio-based systems from sustainably sourced biological resources, replacing carbon-intensive and fossil-based systems, 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, with inclusive engagement of all stakeholders, including policymakers.
- **Improve consumer and citizen benefits, including in the rural settings** by establishing circular and bio-based systems based on sustainability, inclusiveness, zero pollution³⁵, health and safety; reaching a significantly higher level of involvement of all actors (manufacturers, retailers, service industry, consumers, public administration, primary biomass producers etc.).
- **Safeguard multi-functionality and management of forests in Europe** based on the three pillars of sustainability (economic, environmental and social), in particular to optimise the contribution of forests and the forest-based sector to climate change mitigation and adaptation.
- **Enlarge potential of marine and freshwater biological resources and blue biotechnology** to deliver greener (climate-neutral and circular) industrial products and processes, and to help characterize, monitor and sustain the health of aquatic ecosystems

³⁴ See also Destination 4 ‘Clean environment and Zero pollution’ of this Cluster.

³⁵ See also Destination 4 ‘Clean environment and Zero pollution’ of this Cluster.

for a healthy planet and people and propose accompanying changes in regulation where necessary.

Heading 1 – Enabling a circular economy transition

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CIRCBIO: 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 XX and XX 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 XX 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>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 achieve deep cooperation between them by means of specific activities which must be included in at least one of their work-packages; • 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; these must be included in at least one of their work-packages; • Proposals must participate in the CCRI’s events; these must be included in at least one of their work-packages; <p>Applicants must integrate explicitly these obligations into their proposal’ work plan</p>

Expected outcome:

Successful proposals will support the delivery of solutions to implement the European Green Deal, the circular economy action plan 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.

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

- Significantly improved circularity and reduced GHG emissions in economic sectors, natural ecosystems, and ensure 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 circular and climate-neutral practices among citizens and their participation in circular systemic solutions.
- 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 achieve 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:

- Implement and demonstrate circular systemic solutions for the deployment of the circular economy in cities, regions or their groupings
- Address economic, social, environmental dimensions of the transition and include science, technology and governance components
- Active participation of all relevant actors in cities and regions
- Implement circular systemic solutions not only for waste and water management, but also in other sectors including, for example batteries and vehicles, electronics and ICT, packaging, plastics, textiles, construction and buildings, food and nutrients
- High replicability and scalability potential
- Complementarity and cooperation with existing and future relevant European projects on the circular economy and the circular bioeconomy and to cooperate with CCRI.

HORIZON-CL6-2023-CIRCBIO: 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 between EUR XX and XX 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 XX 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 by means of sharing with this initiative knowledge and experiences gained through the implementation of the CCRI-PDA service; these must be included in at least one of their work-packages; • Proposals must participate in the CCRI’s events; these must be included in at least one of their work-packages; <p>Applicants must integrate explicitly these obligations into their proposal’s work plan.</p>

Expected outcome: The Circular Cities and Regions Initiative’s Project Development Assistance (CCRI-PDA) will be included in the instruments implementing the European Commission’s Circular Cities and Regions Initiative (CCRI).

CCRI-PDA projects’ results are expected to contribute to the delivery of a series of sustainable circular economy projects and innovative financing solutions/schemes at local and regional scale across Europe.

Scope:

- To help project promoters develop their circular economy projects and to bring together the technical, economic and legal expertise needed for developing circular economy investment projects at local and regional scale
- To 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.
- To provide tangible showcases that should trigger further market replication and implementation of innovative financing schemes for circular economy investments at local and regional scale.
- The economic sectors involved should be selected according to local and/or regional circular economy needs.
- Proposals should clearly focus their activities on the launch of significant circular economy investments at local and regional scale to cooperate with CCRI and participate in the CCRI's events.

HORIZON-CL6-2023-CIRCBIO: 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 XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Actions

Expected outcome: Successful proposals will support the delivery of solutions to implement the European Green Deal, the circular economy action plan 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.

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

- Accelerating the deployment of circular systemic solutions at local and regional scale
- Increased capacity, efficiency and efficacy of circular economy support organisations, 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 circular economy support organisations

- More effective widespread uptake and easier replication, scalability and visibility of circular systemic solutions and hence multiplication of their economic, social and environmental benefits
- 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, EU Bioeconomy Strategy and the European Industrial Strategy at local, regional, national, European and international levels.

Scope:

- Sharing knowledge, methodologies, tools and experiences.
- Increasing the chance of success of circular systemic solutions by providing more technical support to local and regional circular economy initiatives.
- Activities of circular economy support organisations must be well coordinated – in order to reduce overlaps and competition and provide better clarity and orientation on what support is available for local/regional initiatives.
- Activities of support organisations must be carried out in close coordination and cooperation with the CCRI scheme, and their pilot and fellow group of cities and regions.
- Complementarity and cooperation must be ensured with relevant existing and future CCRI projects of Horizon 2020 and Horizon Europe.
- Target group: circular economy support organisations, such as research and technology organisations, associations of cities and regions, other support organisations providing technical assistance to urban and regional circular economy initiatives and projects.

HORIZON-CL6-2023-CIRCBIO: Novel sustainable and circular bio-based textiles

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 the development of innovative and sustainable value-chains in the bio-based sectors.

Project results are expected to contribute to the following outcomes:

- Significantly reduce the negative impact of textiles throughout their lifecycle; this includes: primary raw materials and water consumption, land use, as well as GHGs and other pollutants emissions (zero pollution), via resource efficiency improvements and circularity of resources
- Significantly increase recyclability of textiles; it is estimated that currently less than 1% is recycled into new textiles worldwide
- Address social pressures in addition to environmental effects; projects should ensure sustainable, circular and socially just textile production at EU level, while international cooperation for enhancing sustainable, just and circular production is strongly encouraged
- Empower SME participation and improve academia/industry interactions
- Establish new value chains with a positive impact on competitiveness and jobs

Scope:

- Design and scale-up of sustainably produced circular bio-based textiles of different applications, e.g. technical textiles, garments, industrial textiles; this includes innovative smart textiles and those providing additional functionalities (e.g. antimicrobial or fire resistance properties)
- Valorisation of secondary biomass, residues and under-utilised (primary or secondary) biomass (LULUCF and biodiversity considerations)
- Design for circularity, enabling material design for end-of-life recyclability and upcycling (including usability of waste fibres), with attention to the final application(s)/end use of textiles
- Design for quality, safety, and durability, with consideration of the sustainability and circularity of textiles value chains and the final application; this includes preventing micro- and nano-fibres (tbc) release
- Development of processing and other technologies to reduce the environmental and climate footprint of textiles production (pre-treatment, dyeing, and finishing steps)
- EU and local production of bio-based textiles, creating sustainable and circular business models

Capitalise on the results of past and ongoing EU research projects, taking care to avoid overlaps and benefit from synergies.³⁶

HORIZON-CL6-2024-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to the following outcomes:

- Identification, development and testing of innovative solutions for the labelling of textile products as enabler of separate collection for reuse and end-of-life treatment
- Recommendations on best innovative solutions for the identification of material composition of used textiles/textile waste
- Recommendations on design for recycling for textile products that allows the use of targeted EPR schemes

Scope:

- 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

³⁶ 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)

- Test separate collection options for reuse or end-of-life treatment that could be enforced through EPR schemes

HORIZON-CL6-2024-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to the following outcomes:

- Development of systemic solutions for textile sorting, using innovative digital technologies
- Development of feasible solutions for facilitated disintegration to be incorporated in product design, as an enabler for recycling
- Large-scale deployment of mechanical recycling solutions that deliver competitive, high-quality secondary materials
- Development of thermo-mechanical, chemical and other recycling solutions that are sustainable from a zero-pollution, circular material and energy efficiency perspective

Scope:

- Sorting and recycling of textiles, which 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.
- Minimise the use of hazardous substances in processing and textile treatments
- Test options to facilitate the disintegration of textile products

- Demonstrate and deploy at large scale innovative solutions for increased quality, non-toxicity and durability of secondary materials and their processing and treatments.

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 the acceleration of regional, rural, local/urban and consumer-based transitions and to improved consumer and citizen benefits.

Project results are expected to contribute to the following outcomes:

- Significant, well-documented increase in material efficiency in covered households
- Significant reduction of emissions of GHG and other pollutants, including micro- and nanoplastic fibres from covered households
- Improvement of living conditions in covered households
- Multiplier effect; leading by example
- Lessons learnt for a European rollout strategy and integration with sectoral strategies such as Circular Cities and Regions Initiative (CCRI)

Scope:

- Target the transition from a take-make-waste society to sustainability, resource-efficiency, zero pollution and circularity in households in pilots with NGOs and CSOs, by experimenting with different behavioural approaches in a scheme of 100 circular households

- Focus on areas where the environmental impact and the potential for circularity is high, and address household electronics, textiles, food, packaging and the respective waste, furniture, housing, modes of consumption in general, at the level of individual behavioural decisions
- Establish a cost-free support service directly targeted at citizens, working at the interface between retailers/service providers, insurances etc., where necessary also public services and administration, and households
- Target social disparity and empower consumers and public buyers, and address financing and amortisation issues that could be a barrier at household level, with the aim to make sustainable living accessible and inclusive
- Demonstrate how sustainable products, or rather 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
- Propose measures that are easy to implement and at least cost-neutral for households, from environmentally friendly purchasing, shared product use, swaps to optimised maintenance, upgrade, repair, to waste disposal
- Analyse results and present them in a robust way that allows multiplication through media initiatives and on the ground, via public authorities or directly by individual actors that want to replicate and implement successful circular measures in their remit; establish links to territorial initiatives

HORIZON-CL6-2024-CIRCBIO: Innovative circular solutions for furniture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 improved consumer and citizen benefits and to European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to the following outcomes:

- Increased deployment and market uptake of circular design, including design for easy maintenance, repair, remanufacturing and recycling
- Increased reuse and refurbishment rates and diffusion of new circular business practices, in particular in the uptake of repair, reuse and refurbishment
- Increased deployment and market uptake of new technological solutions to waste management and high-value recycling
- Emergence of new value chains with particular attention to SMEs
- Increased level of information and awareness of citizens and public buyers regarding circular, zero-pollution and climate-neutral products and services

Scope:

- Design for circularity in furniture, including the issue of material quality necessary for circularity and the role of hazardous substances
- Innovative solutions and designs for increased circularity, quality, non-toxicity and durability of materials and products, including bio-based materials
- New value chains, including innovative collection and reverse logistics infrastructure
- Innovative solutions for furniture related services, repair, reuse, refurbishment and upcycling
- Use digital solutions and demonstrate their benefits for increased circularity
- Assess environmental, social and economic impacts from a life-cycle perspective, using the environmental footprint method (PEF) and the EU environmental technology verification (ETV) scheme

HORIZON-CL6-2024-CIRCBIO: Systemic circular solutions for a sustainable tourism

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Innovation Actions

<i>Eligibility conditions</i>	The conditions are described in General Annex B.
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Expected outcome: A successful proposal will contribute to all Destination ‘Circular economy and bioeconomy sectors’ impacts related to consumers and industry, in particular to the acceleration of regional, rural, local/urban and consumer-based transitions.

Project results are expected to contribute to the following outcomes:

- Emergence 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 optimal
- 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
- Increased circular, zero-pollution and climate-neutral practices among users of tourism services and their active participation in circular systemic solutions
- Innovative solutions and new, affordable technologies 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, visibility and replication of circular systemic solutions

Scope:

- Implement and demonstrate circular systemic solutions on the level of cities or regions and include several sectors providing services for visitors and residents such as hospitality, transportation and infrastructure, culture, attractions, nature activities
- Consider waste and water management, batteries and vehicles, electronics and ICT, packaging, plastics, construction and buildings, emissions of GHG and other pollutants of local and long-distance mobility, accommodation and food services
- Develop systemic approaches that steer the behaviour of consumers, both residents and visitors, to pay attention to the circularity and participate in circular practices, contributing to sustainable consumption of tourism services and products
- Address all relevant actors including public administrations, destination management organisations, private sector services and industries including SMEs, citizens (residents and visitors), non-governmental organisations and new types of actors rising from collaborative economy platforms, and economic, social and environmental dimensions

of the transition towards circular tourism and include science, technology, behavioural and governance components

- Consider the costs of transition from the existing models into the new ones, analysing trade-offs/challenges related to their implementation and demonstration
- Analyse the experimented obstacles and drivers and provide clear and precise policy recommendations to improve circular tourism
- The implemented circular systemic solutions and their business models must have a high replicability and scalability potential in order to contribute to the overall transition of tourism towards more sustainable and resilient ecosystems

HORIZON-CL6-2024-CIRCBIO: Increasing the circularity in plastics value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to the following outcomes:

- Increased deployment and market uptake of new technological solutions to waste management and recycling
- Enhanced diffusion and demonstrated benefits of advanced digital solutions in circular businesses
- Emergence of new value chains using upcycled, recycled and/or biobased resources
- Increased upcycling and recycling rates and uptake of recycled material
- Increased resource efficiency along and across value chains, causing a measurable reduction in emissions of GHG and other pollutants

- Strengthened competitiveness and job retention and creation potential of circular value chains under different economic and social conditions

Scope:

- Address sorting and recycling of plastics in line with the priorities of the Circular Economy Action Plan and Zero Pollution Action Plan
- Minimise the use of hazardous substances
- 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 durable products
- Demonstrate increased recovery, recycling and upcycling rates, and a higher uptake of secondary materials for high value applications
- Use digital solutions and demonstrate their benefits for increased circularity
- Assess environmental, social and economic impacts from a life-cycle perspective, using the environmental footprint method (PEF) and the EU environmental technology verification (ETV) scheme

HORIZON-CL6-2024-CIRCBIO: Increasing the circularity in electronics value chains

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in 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 European industrial sustainability, competitiveness and resource independence.

Project results are expected to contribute to the following outcomes:

- Increased deployment and market uptake of circular design, including design for recycling, repair and remanufacturing

- Increased deployment and market uptake of new technological solutions to waste management and recycling
- Increased recycling rates, with a particular focus on critical raw materials, and uptake of recycled material
- Emergence of new value chains for recycled resources and reused goods
- Increased diffusion of new circular business practices, in particular in the uptake of repair, reuse and remanufacturing
- Increased level of information and awareness of citizens regarding circular and climate-neutral products

Scope:

- Strengthen repair, reuse and recycling of electronics, as this is one of the fastest growing waste streams in the EU, with less than 40% of electronic waste recycled in the EU
- Minimise the value loss occurring when fully or partially functional products are discarded because they are not repairable
- Minimise the loss of critical raw materials
- Demonstrate circular business practices, in particular in the uptake of repair and reuse, remanufacture, product-service-systems, and in the full lifetime of products
- Use digital solutions and demonstrate their benefits for increased circularity
- Assess environmental, social and economic impacts from a life-cycle perspective, using the environmental footprint method (PEF) and the EU environmental technology verification (ETV) scheme

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	CSA

<i>Eligibility conditions</i>	XX 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 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 the following expected outcomes:

- Boost the uptake of most promising systemic solutions, innovative recovered products and related business models for sustainable wastewater treatment, recovery and reuse and create a level playing field for innovative companies
- Change perception and behaviour of European citizen towards wastewater management, recovery and 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 policy needs (e.g. water and marine related policies, sludge and industrial emissions directive, Climate Change Adaptation Strategy, Circular Economy Action Plan, Zero Pollution Action Plan)

Scope

- Take stock of the outcomes of major results of past and ongoing EU funded R&I projects on circular use of water, with regards to technologies, eco-innovative solutions and related business models for sustainable treatment, recovery and reuse of relevant resources from wastewater (e.g. nutrients, metals, energy, etc.) and identify future research needs
- Assess their social, environmental and economic impacts of various project results and their contribution the various related EU policy needs
- Exchange information on the experiences related to the various business models for future replication, use, policy and market uptake of project results, analyse related barriers and provide recommendations for best practices.
- Analyse the standardisation need of water products, in relation to secondary raw materials from wastewater treatment plants.
- Analyse the social perception and related biases of water reclamation and reuse with a view to increase awareness between various water users and citizens

- Develop new education and training programmes for upskilled young professionals in circular use of water

HORIZON-CL6-2024-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	IA
<i>Eligibility conditions</i>	XX The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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 the following expected outcomes:

- Demonstrate the benefits of decentralised approaches for water and wastewater treatment in different geographic, climate and economic conditions.
- Improve co-design co-creation processes between all relevant stakeholders and enhance public engagement to speed up the market uptake decentralised solutions.
- Enhance systemic circular economy approach to water to minimise water pollution and the environmental footprint of water activities and ensure water security
- Support the implementation of relevant EU policy needs (e.g. water and marine related policies, Climate Change Adaptation Strategy, Circular Economy Action Plan, Zero Pollution Action Plan, Chemical Strategy)

Scope:

- Develop 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.

- Assess the environmental impact of decentralized water and wastewater systems and the potential for climate mitigation and adaptation
- Develop an overarching optimization framework for integrating decentralised water and wastewater system in a centralised infrastructure, 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) strengthening public participation and engagement and public private partnerships
- Address potential regulatory and financial 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.
- International cooperation is encouraged

Heading 2 – Innovating for sustainable bio-based systems and the bioeconomy

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CIRCBIO: Non-plant biomass feedstocks for industrial applications – processes to convert non-lignocellulosic biomass and waste into bio-based chemicals, materials and products to improve the cascading valorisation of biomass

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in 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.

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

- Increased sustainability of biomass resources, lowering land dependence, meeting biodiversity goals and respecting ecosystems integrity.
- Improved climate-neutrality, zero pollution and resource efficiency via practical application of the circular (bio)economy concept.
- Increased and new 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.
- Environmental, economic and social benefits on territorial and especially municipal level, due to increased circularity and upcycling of low-value non-lignocelulosic biomass (NLBM) (waste), including its upcycling into high-value applications.
- SMEs engagement, including the regional dimension, for skilled job creation.
- Increased cooperation and awareness of circular bio-based value chain operators, including waste managers, biomass providers, bio-based industry and end-users (by participatory approaches to understand and incorporate customer needs/feedback, and comprehensive scoping, including on environmental level (NGOs, civil society).

Scope:

Sustainable 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 scale-up processes to valorize such feedstock towards high-value bio-based products. Non-lignocellulosic biomass (NLBM), and related organic waste, provide options beyond plant biomass and its residues. However, NLBM (e.g. chitinous biomass, sewage sludge, feathers), 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.

Activities should address:

- Identification and optimization of suitable NLBM feedstock, with focus on higher resources efficiency and circularity, to be deployed in adequate production systems, including via upcycling approaches.
- Demonstrate the techno-economic feasibility to valorize NLBM (at scale) via sustainable (process) technologies both upstream and downstream (including the application of enzymes³⁷ and diverse industrial biotech).

³⁷ See a parallel topic HORIZON_CL6-2023-CIRCBIO-xx-xx Broadening the spectrum of enzymes and microbial hosts in industrial biotechnology.

- Ensure process flexibility, coping with the potential composition heterogeneity of chosen NLBM feedstock.
- Expanding the portfolio of high-value bio-based products (chemicals and materials) that can be obtained in NLBM integrated biorefineries, for new competitive edge in the EU (e.g. cosmetics, pharmaceuticals, biofertilizers).
- Application of robust life-cycle assessment approaches to ensure gains in environmental performance (including biodiversity), but also socio-economic resilience aspects, as well ensuring safety for the consumers and operators.
- Production of biofuels and bioenergy from NLBM falls outside the scope of this topic.
- Where relevant, proposals should seek links with and capitalise on the results of past and ongoing research projects (especially under the Bio-based Industries Joint Undertaking/Circular Bio-based Europe)³⁸.

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in 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 / EU strategic autonomy.

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

³⁸ See also complementary topic HORIZON-CL6-2023-CIRCBIO-xx-xx ‘Land-based bioprospecting and production of the bioactive compounds and functional materials for multiple bio-based value chains’.

natural, sustainable and ‘eco-friendly’ materials and products for various sectors and applications. These will deliver clear-cut benefits for consumers by being more effective and/or eco-friendly, cheaper, and more readily accessible than existing fossil-based alternatives;

- Improved sustainable exploitation, cultivation and processing methods based on promising species/organisms, and chosen production routes; matched with diminished pressure on the natural resources (especially biodiversity) in situ.
- Increased competitiveness of European biotechnology, in particular the SMEs sector.
- Increased public knowledge 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 studied³⁹, the potential for developing new applications and products is far from exhausted⁴⁰. There are still significant opportunities to improve the biodiscovery process as well as understanding of specific biochemical pathways leading to high-value applications, 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.

Activities should address:

- Technical improvements of the bioprospecting of broad land-based sources (all land-based organisms are covered) for potential bioactive compounds and functional materials, based on identified suitable sources of feedstock.
- Addressing sustainable biodiscovery, including by advanced detection methods, such as in silico database analysis, microfluidics, 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

³⁹ e.g. Horizon 2020 topic FNR-11-2020. Prospecting aquatic and terrestrial natural biological resources for biologically active compounds, ongoing project [InnCoCells](#)

⁴⁰ 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>

and ecosystems, allowing better assessment of the selected bioactivity/functional property potential.

- Defining the optimal 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 its sustainable supply, if appropriate, covering an outline of continuation of the end-product development beyond the project timeline and its present resources.
- Demonstration of environmental benefits 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. This should cover the environmental and safety/health impacts of the developed products 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 protection products (chemical pesticide substitutes) are also not in scope, to avoid overlaps with a parallel topic⁴¹.

HORIZON-CL6-2023-CIRCBIO: Broadening the spectrum of enzymes and microbial hosts in industrial biotechnology

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

⁴¹ HORIZON-CL6-2024-FARM2FORK: Innovations in plant protection: alternatives to reduce the use of pesticides focusing on candidates for substitution

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.

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

- Enhanced bio-based sector competitiveness, and economic sustainability, including the SMEs sector, by ensuring higher production flexibility. This will be achieved via a paradigm shift from enzymes and microbial-hosts⁴² dependent processes to hosts and enzymes evolved for process flexibility.
- Significant environmental and climate-neutrality contributions via higher resource efficiency (sustainable biomass feedstock valorisation) and circular (bio)economy, as well minimised pollution from production processes.
- Long-term benefits to consumers and end-users, by more environmentally-friendly and more economically feasible applications in diverse economic sectors and value chains, underpinned by progress in biotechnology.

Scope:

Exploring the potential of scaling up enzymatic catalysts and microbial hosts⁴³ and their potential to offer significant gains in: bio-based processes flexibility, resource efficiency, lowering energy and other resource barriers, and allowing for development of new, or significantly optimised, sustainable products and processes. The topic aims to support the:

- Identification of novel natural enzymes and bioprospecting on industrial microbial hosts, especially for extreme habitats, e.g. from the extremophiles, de novo design and generation of novel and optimized enzymes for processing of various biomass feedstock.
- Optimisation of enzyme or microbial host properties for industrial use, addressing process conditions barriers.
- Development of novel enzyme or industrial microbial host production concepts.
- Development of novel concepts for enzyme-catalysed processes (e.g. engineering of enzyme cascades/multi-enzyme reactions, co-factor regeneration).
- Further optimized enzyme-based production processes with respect to biotechnological, economic, ecologic and safety parameters and standards, as well as to lower environmental impacts

⁴² Including eukaryotic organisms such as fungi

⁴³ Including eukaryotic organisms such as fungi

- Further automatisation and integration of unit operations, process analytical technologies (PAT), digitalisation of production.
- Linking to the ongoing work on sustainability improvements via industrial biotechnology⁴⁴, if underpinned by the thematic focus on enzymes.
- Sourcing of enzymes and microbial hosts from marine environments is not in scope to avoid overlap with a parallel topic⁴⁵.

Seek synergies and capitalise on the results of past and ongoing EU research projects, taking care to avoid overlaps, and benefit from any synergies⁴⁶

HORIZON-CL6-2023-CIRCBIO: Bio-based solutions for humanitarian applications

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: Successful proposals will provide humanitarian aid operators and bio-based sector stakeholders with information on the sustainable performances and circularity of bio-based solutions, suitable for humanitarian purposes. Projects’ results will contribute to the development of innovative and sustainable value-chains in the bio-based sectors and improve social benefits, including in rural settings while also being in line with the European Green Deal, the EU circular economy and zero pollution action plans.

⁴⁴ See parallel topic HORIZON-CL6-2023-ZEROPOLLUTION-xx-xx Industrial biotechnology approaches for improved sustainability and output of industrial processes

⁴⁵ HORIZON-CL6-2024-CIRCBIO-xx-xx: Targeting marine extremophiles for sourcing novel enzymes, drugs and chemicals.

⁴⁶ 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’.

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

- Identification of sustainable bio-based solutions applicable in humanitarian aid contexts, addressing the technical challenges posed by diverse environmental, social and economic conditions.
- Improved waste management in humanitarian aid contexts.
- Significant reduction/minimisation of waste (e.g. plastic) littered in the environment.

Scope:

The global solid waste management crisis 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, Based on existing assessment studies⁴⁷, 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 and composting of waste materials in humanitarian settings, .

Proposal should:

- Assess the scope for which bio-based innovative technological solutions, (e.g. plastic products and packaging, logistic assets, textiles, etc.) have more environmentally sound applicability in humanitarian contexts (scoping exercise).
- Evaluate socio-economic/governance aspects, including their replication potential.
- Include lifecycle assessment to examine the potential to reduce environmental impact (accounting also for biodiversity and ecosystems preservation and enhancement) of proposed solutions under relevant humanitarian aid conditions (diverse environmental, social and economic conditions).
- Develop guidelines or recommendations for further R&D needs, potentials and up-take, based on the scoping exercise.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing projects⁴⁸, including under Horizon Europe as well as the Circular Bio-based Europe JU. International cooperation is encouraged. SSH aspects should form an essential part of projects.

⁴⁷ World Food Programme Environmental Sustainability Unit

⁴⁸ See parallel topic HORIZON_CL6-2023-CIRCBIO-xx-xx Programmed biodegradation capability of bio-based materials and products, validated in specific environments including extreme environments.

HORIZON-CL6-2023-CIRCBIO: Symbiosis in the bio-based industrial ecosystems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

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, in line with the EU circular economy action plan and the bioeconomy strategy.

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, which maximize the 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:

The transition towards an effective circularity and zero pollution of the industrial ecosystems in the Union requires, as one of the segments of the value chains, that the production of good and services optimize the use of any resource. Industrial symbiosis is instrumental to circular economy, as it is based on the share of resources between facilities when wastes or by-product 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, minimizing the use of input resources and the environmental impacts 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.

The implementation and scale up of industrial symbiosis in the bio-based industries requires the:

- Development of methods and approaches individuating and assessing technical solutions in specific sectors/facilities, including supported by digital innovation; environmental sustainability and the economic and social dimensions should be included.
- A targeted reporting and certification system, based on ad-hoc monitoring capacity along the bio-based value chains working in symbiosis.

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. SSH aspects should be included.

HORIZON-CL6-2023/2024-CIRCBIO: Eco- and circular-by-design bio-based technologies/materials

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million (XX M EUR 2023 / XX M EUR 2024).
<i>Type of Action</i>	Research and innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

Successful proposals will enable the bio-based industries in the Union to contribute to the deployment of innovative and sustainable value-chains, in line with the EU circular economy and the EU zero pollution action plans, and the bioeconomy strategy.

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

- Eco and circular design of bio-based materials and products: decreasing carbon footprint and environmental impacts, increasing durability and suitability of products to be safely re-use and re-manufactured, allowing for high-quality recycling, increasing the safe recycled content.
- Product information systems enabling the circularity, zero pollution and safety of the bio-based manufacturing sectors and of the products' use at consumers' level.

Scope:

- Proposals should aim at the optimisation of product and processing design, towards environmental sustainability and circularity, and improved products end-of-life options (e.g. long circular lifecycle, i.e. durability, reuse, repair, remanufacturing and recycling patterns).
- Proposals should contribute to the establishment of sustainable, low emission, resilient, competitive and equitable production and consumption systems through the development of product information systems demonstrating the sustainable use of biological resources from land and sea, , including biogenic CO₂, and the resource efficiency all along value chains, from the production to the extended circular product lifetimes and appropriate disposal.
- Proposals should include the assessment of economic and social aspects of the improved production and consumption bio-based systems: in increased economic value and safety along the whole value chains, job opportunities, etc..

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. SSH aspects should be included.

HORIZON-CL6-2023-CIRCBIO: Programmed biodegradation capability of bio-based materials and products, validated in specific environments including extreme environments

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

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 line with the EU circular economy and the EU zero pollution action plans. .

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

- Eco and circular design of bio-based materials and products: decreasing carbon footprint and environmental impacts, increasing suitability of products to be safely re-use and re-manufactured, allowing for 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 targeted performances and end-of-life options for specific applications.

Scope:

- Design and manufacturing of biodegradable non single-use/single-use bio-based materials and products: decreasing carbon footprint and environmental impacts, increasing suitability to be safely re-use and re-manufactured, allowing for recycling and for biodegradability.
- Assessment of applications where biodegradation could enable safe and sustainable end-of-life options, e.g. in humanitarian contexts⁴⁹ where waste management systems for collection, sorting and recycling are not feasible.
- Specific focus on the case of uncontrolled waste disposal, including in the open environment, particularly of plastic waste
- Innovative manufacturing of biodegradable bio-based materials and products with targeted performances including product circular life extension through predictive maintenance and programmed biodegradation, compared to the timeframe needed for their integrity, in specific environments depending on the application, including for food-packaging applications. Use of innovative and adapt existing AI-based and other digital technical solutions to optimise the circular lifecycle of products and make it more environmentally and economically sustainable.
- Biodegradation test validated in open environments, e.g. soil and water, under ranges of physical/chemical conditions; time-frame of partial up to full biodegradation monitoring; impacts on biodiversity
- Provide insights on 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 of the materials and products within the scope. Information should be provided on the risks and environmental impacts of an uncontrolled disposal into the open environments.

⁴⁹ See parallel topic HORIZON-CL6-2023-CIRCBIO-xx-xx: Bio-based solutions for humanitarian applications

- Assessment of overall environmental impacts and economic feasibility of the manufacturing.

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.

HORIZON-CL6-2023/2024-CIRCBIO: Digital information systems for bio-based products

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million (XX M EUR 2023 / XX M EUR 2024).
<i>Type of Action</i>	Research and innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

Successful proposals will support the bio-based industries and the digital transition enablers in the Union to contribute to the development of innovative and sustainable value-chains in the bio-based sectors, in line with the EU circular economy action plan and its sustainable product initiative, the EU digital strategy’s circular electronics initiative and the EU data strategy.

Projects results are expected to contribute to the following expected outcome:

- Mobilising the potential of digitalisation of bio-based sectors.

Scope:

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, 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 EU Digital strategy’s Circular Electronics Initiative 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.

Proposal should:

- Deliver on the design of solutions for the digitalisation of bio-based product information and value chains data such as digital passports, tagging and watermarks, etc. and enabling their use;
- Specializing the information of bio-based products on carbon footprint and environmental impacts, end-of-life options, safety control, performances, programmed/predicted durability and maintenance, etc.;
- Supporting customers and consumers in making responsible and informed choices
- Supporting the harmonisation of tools and format of the digital information;
- Enabling bio-based industries to participate in the European Dataspace for Smart Circular Applications;
- Design the interfaces between the digital products information 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. SSH aspects should be included, such as the link between digitalisation and the resilience of economies to disruptions, such as the one suffered from COVID-19 crisis.

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in 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.

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

- Higher environmental sustainability, including on the climate targets, 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 Initiative⁵⁰ and the Renovation Wave⁵¹
- Demonstrated non-toxic and zero-pollution properties of the construction materials, 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
- 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, policy-makers, consumers and end-users, for the bio-based construction product segments. This is expected to contribute to the policy-feedback on innovative construction materials, and to resolving related regulatory bottlenecks.

Scope

- The topic covers bio-based inputs, understood both directly as bio-based feedstocks, e.g. agro-forestry⁵² 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 inputs can also contribute with the bio-based principles (understood as genetic/physiological/biochemical backgrounds resulting in improved properties of the final bio-based products, e.g. developed by fermentation, or biomanufacturing), which may be exploited via the biotechnology approaches. Also, the hybrid integration of biological living organisms into traditional or bio-based construction materials (e.g. plants, algae, fungi) might be considered, if leading to higher quality and environmental impact. The range of final materials is broad and may cover composites, insulation materials, interior or exterior elements, adhesives, etc., depending on the construction value chain selected.
- There is also scope for innovation in terms of bio-based production improvements (e.g. additive bio-based manufacturing, nature-based solutions), leading to new construction-oriented consumer applications. This effort should benefit from innovation developed

⁵⁰ COM(2021) 573 final “New European Bauhaus Beautiful, Sustainable, Together”

⁵¹ COM(2020) 662 final “A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives”

⁵² Synergies with R&D on traditional bio-based feedstocks such as wood may be sought, e.g. see topic HORIZON-CL6-2024-CLIMATE-xx-xx: Climate-smart use of wood in the construction sector

both from the technical angle, but also from social innovation and from inclusive participation of all actors, including a possibility to develop and provide recommendations for regulatory actions, related to new bio-based construction materials, if relevant.

- The safety and user experience aspects should be 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.
- International cooperation is encouraged to benefit from exchange of best practices, while taking care of European competitiveness.

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: This topic is supporting the Bioeconomy Strategy 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:

- Development of replicable, scalable production and business models offering economic opportunities in rural areas and contribution to a fair distribution of benefits in bio-based value chains.
- Identification of factors for success and development of 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.
- Diversification and enhancement of agricultural incomes (organic and conventional farming)

Scope

- 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 based on by-products, residues and wastes from agriculture and forestry.
- Develop and promote business models for different farming sectors (including organic production) in the EU built on existing rural infrastructures, support the economies of scale, and contribute to a fair distribution of costs, benefits and risks amongst the economic operators involved with a focus on primary producers.
- Explore existing investment options, including non-traditional sources of investment (e.g., cooperation with waste management companies, public authorities, etc.) and identify barriers and enablers for sustainable long-term operations.
- Connect with a wide range of stakeholders (farmers, foresters, industry, processors, advisors, etc.) and develop together a portfolio of research and innovation priorities that can be implemented in Horizon Europe and relevant partnerships such as the Circular Biobased Europe.

HORIZON-CL6-2024-CIRCBIO: From silos to diversity – small-scale bio-based demonstration pilots

Specific conditions	
<i>Expected contribution per project</i>	<i>EU per</i> The Commission estimates that an EU contribution between EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: This topic supports the Bioeconomy Strategy and the Common Agriculture Policy by addressing the fact that most biorefinery models are predominantly based on complex technologies, which are difficult to finance and therefore remain inaccessible to many players.

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

- Development of replicable, scalable production and business models.
- Increased awareness and dialogue across sectors on availability, needs and options for smart use of agricultural waste, by- and co-products through creation of joint stakeholders platform and other joint structures.

- Developing new products with considerably less CO2 emissions and at higher value than the current application of feedstock side streams.
- Diversification and enhancement of agricultural incomes (organic and conventional farming)

Scope

- Demonstrate the valorisation of local unutilised feedstock, such as by-products, residues and wastes, from land and livestock, identify suitable processes and technologies to produce value-added and innovative bio-based products (such as food/feed ingredients, chemicals, materials) and bioenergy from secondary resources (fuels, power heat) via biorefinery processes.
- Build-upon existing food and feed and/or biomass-based energy value chains, including organic farming sectors, thereby strengthening their economic sustainability and making them ecologically more sustainable.
- Contribute to improved knowledge on feedstock requirements, harvesting and logistics (e.g. machinery, agricultural storage networks, online information platforms, etc.) and demonstrate ecological, economic environmental and social benefits of new bio-based value chains.
- Prove the economical access to sufficient raw materials for setting-up new supply chains and provide evidence that the used feedstock streams are grown on land that is unsuitable for food production or represent underutilized residues from the agro-food industry.

Heading 3 – Innovating for blue bioeconomy and biotechnology value chains

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CIRCBIO: Novel culture of marine organisms for blue biotechnology applications

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected Outcome:

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

- Expanding the potential of marine biological resources and learning from the function and processes of marine living organisms;
- Develop marine biotechnology providing solutions to produce materials, enzymes, food supplements and pharmaceuticals;
- Increase biodiscovery of products and sustainable methods for marine bio-based production as an alternative to wild harvesting;
- Support green industrial bioprocessing and more sustainable bio-based products through new biotechnology processes and applications;
- Contribute to the development of circular processing.

Scope:

The biotechnological exploitation of marine microorganisms often requires their cultivation and the optimization of production yield for the compounds of interest. The culture of marine organisms offers sustainable alternative to wild harvesting. The vast majority of marine life (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. Culture methods for vertebrate and invertebrate cell lines are also lacking for the production of active compounds. The complex, symbiotic nature of marine organisms means that new culture methods will be required for industries in this sector. New culturing methods based on co-metabolism between community members represent a radical change from the conventional “isolate and enrich” approach to cell culture. New culture methods (including mix cultures) bio-engineering tools and the use of marine model organisms will improve the availability of marine metabolites for industrial applications. Proposals will develop and optimise culture methods and conditions so that the relevant metabolites are appropriately expressed and can be recovered with selective downstream processing techniques. Algae is not under the scope, given the fact that it was covered under a specific topic in the WP2021-2022.

HORIZON-CL6-2024-CIRCBIO: Targeting marine extremophiles for sourcing novel enzymes, drugs and chemicals

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

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

- Contribute to expand the sustainable exploration of biodiversity hotspot regions, e.g., deep-sea and polar regions;
- Advance in developing the next generation of sampling methods, technologies, as well as understanding the legal frameworks within which the development operates;
- Support green industrial bioprocessing and more sustainable bio-based products through biodiscovery of novel marine sources and new biotechnology processes and applications;
- Increase commitment to conserve and sustainably use the ocean’s genetic diversity and contribute to understanding of potential trade-offs in exploiting ocean biodiversity.

Scope:

Some marine ecosystems make survival challenging due to highly complex and extreme conditions such as temperature, pressure, alkalinity or acidity/pH level, extremely low nutrients, etc. Extremophilic organisms are capable of thriving/surviving in such extreme environments (deep hydrothermal vents, hypersaline lagoons, sub-seafloor sediments). They are capable of adapting to such extreme ecological conditions by changing their metabolism and physiological structures. They can be targets for bioprospecting novel and highly efficient enzymes, chemicals and drugs. Extremozymes have become the focus of research activity because they are capable of functioning under extreme operating conditions, similar to the conditions encountered in industrial enzymes. Enzymes derived from low temperature microorganisms, specifically proteases and lipases, hold significant potential for the cleaning industry. On the contrary, deep-sea volcanoes microorganisms are researched for their unique enzymes, capable of operating in high-temperature conditions. In addition, enzymes extracted from deep-sea organisms are capable of pressure adapting mechanisms, both in structure and function. Extreme environments with huge bioresources still present enormous challenges for exploration and sampling operations. Challenges are encountered due primarily to the

depth and pressure conditions, which make exploration technically difficult, risky and expensive.

Heading 4 – Safeguarding and sustainably innovating the multiple functions of EU forests

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-CIRCBIO: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: This topic supports the new EU Forest Strategy by securing and adjusting the production of wood and non-wood forest products of small-scale forest holdings sustainably. Genuinely and cross-disciplinary approaches are needed which include the socio-economic dimension as well as the engagement of the broader stakeholder communities.

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

- Development of regional and local management models for small-scale forest holdings adapted to the wide variety of contexts found in the EU.
- Better understanding of knowledge, skills, motivation and needs of owners of small forest properties, 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 building of a bio-based economy, the reduction of greenhouse gas emissions, the provision of ecosystem services and the conservation of forest biodiversity.

Scope

- Create a better understanding of small forest property owners’ settings, including traditional and non-traditional owner types as well as female forest owners.

- Explore, analyse and promote innovative forest management approaches, including silvicultural practices, digital tools, organisational, cooperation and business models, advisory services, education and training, policy frameworks, social and institutional innovation for different ownership types.
- Collect, analyse, and assess targeted approaches for activating and mobilising forest owners, particularly non-traditional, non-farm, absentee, urban or female forest owners taking into consideration good practice guidance and examples.
- Address production potentials with a view to ensuring sustainable production of wood and non-wood forest products through improved integrated management approaches.
- Develop new business models for improved utilisation of damaged (burnt, broken, declined conditions etc.) or infected wood (e.g. by bark-beetle, etc.), forestry side streams and non-wood forest products.

HORIZON-CL6-2023-CIRCBIO: Capturing market trends and societal perceptions for tailor-made forest ecosystem services

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: This topic contributes to the new EU Forest Strategy by addressing new opportunities for primary producers to diversify the income 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 of forest ecosystem services.
- Development of decision support and management tools that will facilitate joint delivery of multiple forest ecosystem services
- Increased long-term resilience of forest ecosystems and associated socio-economic value chains

- Improved guidelines on PES (Payment for Ecosystem Services) design and implementation in Europe formulated and disseminated.

Scope

- Set-up a policy forum to recurrently disseminate research results, discuss options for upscaling promising approaches and collaborate with relevant policy makers, stakeholders and the wider public.
- Explore the evolving societal demands 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 capacity to deliver them in the best possible way.
- Improve the understanding of ecosystem service interactions at different temporal scales, both short-term and long-term, consider relevant social, environmental and economic interdependencies and identify region and national specific market-driven approaches to create new or reactivate value chains and business models based on cooperation 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 with sufficient implementation length and data availability for a holistic impact evaluation.
- Improve existing and develop new business models for valuing and funding the sustainable management of forests resources, including through the valuation of ecosystem services such as biodiversity, water replenishment, flood prevention, non-wood products, natural carbon sequestration and storage, soil protection, recreation, health amenities etc.;
- Develop standardised methods for their valuation where needed with the goal to facilitate the best possible delivery of ecosystem services.

HORIZON-CL6-2023-CIRCBIO: Monitoring the multi-functionality of European forests

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.
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Expected outcomes: This topic supports the implementation of the new EU Forest Strategy by addressing the design of a comprehensive forest information system that align information on forest state, ecosystem services (including biomass) provision and socio-economic ecosystem services demands.

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, over 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 bio-based economy, the reduction of greenhouse gas emissions, the provision of ecosystem services and the conservation and restoration of forest biodiversity.
- Better understanding of the quantity and quality of EU forests, their multifunctional role and resilience needs under climate change and contribution to halting the loss of biodiversity.

Scope:

- Consider the latest scientific knowledge and technology for the development, combination, and utilisation of reliable data from multiple sources (e.g., national forest inventories, ground level monitoring stations, 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.

Destination – Clean environment and zero pollution

Anthropogenic pollution undermines the integrity of Earth ecosystems and severely affects natural resources essential for human life. Keeping our planet clean and our ecosystems healthy will not only contribute to 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 the related initiatives targeting environmental challenges, particularly the EU zero pollution action plan, the 2030 Climate Target Plan, and other relevant EU legislation⁵³, this destination seeks to halt and prevent pollution by focusing on removing the pollution of fresh and marine waters, soils, air, including from nitrogen and phosphorus emissions, on substituting harmful chemicals, on improving the environmental sustainability and circularity of bio-based systems as well as on reducing environmental impacts and pollution from food systems. Synergies with other clusters (notably 1 and 5), relevant destinations as well as missions and partnerships will be exploited.

Halting emissions of pollution to air, soil and water aims at identifying and demonstrating approaches to combat diffuse emissions of pollutants from land and urban 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 (including 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 media are concerned, a systemic approach is necessary to limit N/P emissions from different sources, and to bring N/P flows back within safe ecological boundaries, for instance by improving the management of fertilising products in agriculture while considering regional conditions. Actions will include showcasing best practices to recover nutrients from secondary raw materials to produce alternative fertilisers and demonstrating pathways for regions to keep their N/P flows within ecological boundaries.

Protecting drinking water and managing urban water pollution aims to develop and demonstrate a holistic framework bringing together new innovative solutions and approaches to ensure drinking water quality, address urban water pollution and to 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, improving resource efficiency and energy recovery, and limiting as well risks from contaminants of emerging concern. An integrated strategy to harmonise and update monitoring with prioritisation for holistic, overall control of urban water cycle should be developed harnessing the potential of digital solutions

⁵³ E.g. the Circular economy action plan, the biodiversity and farm to fork strategies, the Communication on the sustainable blue economy and its follow-up initiatives, relevant Horizon Europe Missions and Partnerships, the Fit for 55 package, the Zero Pollution Action Plan, and the sustainable carbon cycle initiative, the EU chemicals strategy for sustainability, the European Arctic policy, the twin green and digital transition etc.

Addressing pollution in seas and ocean aims 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 changing marine environment due to changes in climate system. It will further develop and test solutions for integrated assessment and monitoring of the circulation and impacts of contaminants of emerging concern in marine environment, to support the implementation of EU policies such as the Water Framework Directive and Marine Strategy Framework Directive. Actions should also explore the role of pollution in intensifying the climate change related impacts, including in the Arctic, resulting in solutions and strategies for the adaptation of ecosystems and human communities in relation to the changes in the Arctic.

Increasing the environmental sustainability and circularity of bio-based processes and products means that bio-based solutions for environmental monitoring and remediation as well as the concept of sustainability and circularity into bio-based systems are developed. This also includes bio-based chemicals, additives and materials solutions as a contribution to the carbon removal objectives, the chemicals strategy for sustainability (CSS strategy) and safe-and-sustainable-by-design.

Reducing the environmental impact and pollution of food systems focuses on limiting environmental impacts related to air, water and soil pollution in different food value chains processes such as food processing, packaging, transport, retail, and household consumption. This also comprises the reduction of plastic pollution stemming from (single use) plastic food packaging.

Expected impact

Proposals for topics under this destination should set out a credible pathway contributing to halting and eliminating pollution to guarantee clean and healthy soils, air, fresh and marine water for all and ensure a sustainable and circular management and use of natural resources. To reach this objective, it will be paramount to advance the knowledge of pollution sources and pathways to enable preventive measures, improve sustainability and circularity, apply planetary boundaries in practice and introduce effective remediation methods.

- 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
- Balance **N/P flows within safe ecological boundaries** at regional and local scale, thereby contribute to restoring ecosystems
- Move towards achieving **clean, unpolluted ocean and seas**, including in the Arctic as a result of successful scientific, technological, behavioural, socio-economic, governance and green-blue transitions

- **Enhance 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 within the EU and Associated Countries and across borders
- **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
- **Reduce the environmental impact of food systems**, including by adopting environmentally friendly, resource- and energy-efficient food value chain processes and consumption patterns

Heading 1 – Halting emissions of pollution to air, soil and water

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION: 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 EUR XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcomes:

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

- Boosted uptake of improved practices and technologies to optimise manure management (considering trade-offs)
- Improved solutions in reducing GHG emissions and atmospheric pollutants from the livestock sector

- Improved capacity to deal with the management of manure nutrients, increasing circularity and matching demand and supply
- Policy recommendation for improving manure management to mitigate methane emissions and minimize dispersion of undesirable manure components in the environment.

Scope:

Develop 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 from feeding, housing, handling, collection, treatment, storage and application. The following elements must be incorporated:

- 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, exchange of manure/slurries between livestock and crop farms, manure additives to reduce emissions, etc.)
- Improve or develop methods for the measurement and monitoring of GHG (CH₄, N₂O) and atmospheric pollutants (NH₃) from each stage of the manure management
- Improve knowledge on the fate and persistence in the environment (e.g. water, soil) of manure chemicals/contaminants/pathogens and associated health/environmental risks.
- Demonstrations to test the more efficient strategies to mitigate GHG emissions from manure at regional/local scale. Activities should take into account relevant practices, strategies and data on GHG and atmospheric pollutants mitigation from several livestock farming systems, being conventional/intensive, semi-intensive, grazing/low input or organic
- Cost-benefit assessment of practices/technologies used to mitigate GHG emissions and air pollutants from manure, including assessment of trade-offs and co-benefits on animal (e.g. health and welfare) and environment (e.g. nitrate leakage, nitrogen balance and P losses to water)

HORIZON-CL6-2023-ZEROPOLLUTION: Best available techniques recovering/recycling fertilising products from secondary raw materials

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.

<i>Type of Action</i>	CSA
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: Successful proposals will deliver recommendation to policy and stakeholders on the alternative fertilising products able to 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 the following expected outcomes

- Lower N/P emissions to soil, water and air through alternative fertilising products recovered from secondary raw materials
- Collection and analysis of best available techniques for recovering/recycling fertilising products from secondary raw materials, in terms of technical feasibility, environmental performance and socio-economic aspects
- Creation of a forum where best practices are shared among European and international stakeholders

Scope:

The scope of this CSA is the analysis of best available technologies for recovering/recycling fertilising products from secondary raw materials in Europe in order to limit nitrogen and phosphorus pollution in soil, water and air. The analysis should also include the market and regulatory framework (including certification/standardization aspects) and their potential to enable or prevent the wider uptake of these technologies. 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/treated manure as well as other fertilising products from biological resources. The analysis should include technical aspects such as on the characterisation of secondary raw materials, the recovery/recycling operations and their environmental impacts, the pollution prevention operations. It should also include the assessment of the costs of installation/maintenance/upgrade of both recovery/recycling and pollution prevention operations, social benefits, etc. Finally, it should include a regulatory assessment of the identified practices (according to the EU environmental legislation, including concerning aspects in EU legislation in other fields).

Deliverables of projects will consist of collecting and reviewing analyses of available technologies in Europe to individuate the best performances. This output should include the recommendations to policy to ensure the deployment of the best available technologies preventing the emissions of nitrogen and phosphorus to soil, water and air.

Where relevant, proposals should seek links with and capitalise on the results of past and ongoing EU funded projects. SSH aspects should be included.

HORIZON-CL6-2024-ZEROPOLLUTION: Demonstrating how regions can operate within safe regional nitrogen and phosphorus boundaries

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

- A set of nitrogen (N) and phosphorus (P)-balanced, circular and sustainable measures based on an N/P target load approach and regional N/P-optimised budgets, applied across all N/P-relevant sectors and encouraged by targeted governance design
- Demonstrated environmental, economic and behavioural effects of aforementioned measures to limit N/P emissions from all relevant activities while promoting local and regional sustainable and circular economy schemes
- Comprehensive and targeted EU guidance on sustainable and circular practices for restoring regional N/P flows at regional level, made available to relevant actors (policy-makers, local administrations, practitioners, industries etc.)

Scope:

Building on recent innovations in regional nutrient budgeting and quantification, this Innovation Action should demonstrate how to apply sustainable N/P load targets and N/P-optimised budgets at a regional/river basin scale and create the necessary systemic and multi-actor transition pathways to ensure an integrated N/P management, within safe ecological and regional boundaries, across all environmental media. The aim is to illustrate how N/P-relevant sectors can contribute to limiting N/P emissions from all relevant activities to air, water and soil in line with regional N/P budgets. Relevant activities may include agriculture, aquaculture, forestry, industrial sectors, food/drink sector, water supply, water/waste management, bioenergy, fossil-based energy production, mining activities, transport) as well as unintentional losses (e.g. leaching and run-off of agricultural nutrients). N/P-balancing practices will comprise reliably budgeting regional N/P sources based on local conditions, enhancing the sustainability and circularity of N/P-relevant resources and services between urban/industrial and rural/coastal environments, applying targeted governance measures and disseminating best practices and techniques to all involved actors.

HORIZON-CL6-2023-ZEROPOLLUTION: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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 an enhance sustainable water management ensuring its availability and quality increasing the resilience of watering agriculture and reducing its environmental footprint.

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

- Prevent surface water contamination with pesticides, fertilizers and other contaminants via an enhance understanding of current water, fertilizer and pesticide usage and requirements in the agricultural sector for different systems and regions
- Prevent contamination of the natural habitats, including minimizing ground water pollution and securing groundwater resources
- Protect surface water quality against harmful impacts of climate change.
- Advance understanding and prediction of the impacts of climate change in water availability and quality affecting the consumption patterns.
- Design solutions, pathways and strategies for risk assessment, mitigation and adaptation in the event of extreme weather pressures (flooding, drought) considering technical and socio-economic parameters.

Scope:

Water availability and quality is one of the most pressing issues, affecting human health, limiting food production, limiting ecological services, and hindering economic growth. The

uncertain of water availability and its quality is limiting agriculture resilience to climate change and pose a problem of unknown long-term effects on human health and ecosystems.

The projects are expected to deliver on:

- Produce tools to support to farmers, 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 for water for irrigation but also for local people, healthy environment and other economic sectors
- 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 like smart sensors and artificial intelligence (AI) to support decisions in relation to water management.
- Assess and when relevant to propose adaptation of water infrastructure, considering Nature Base Solutions and latest technologies for water infrastructures to emerging needs and environmental challenges like floods or/and droughts to increase agriculture irrigation resilience.
- Develop scientific and practice advise to reduce water losses and ensure appropriate water security and quality in agricultural practices
- Technologies to support a significant reduction of the presence of pesticide residues in water bodies to levels that are no longer harmful

Activities should build on the work done under relevant Horizon 2020 and Horizon Europe projects including H2020 art. 185 PRIMA partnership.

Heading 2 – Protecting drinking water and managing urban water pollution

Proposals are invited against the following topic(s):

HORIZON-CL6-2024-ZEROPOLLUTION: Holistic approaches at city/catchment level ensuring resilient water quality in urban areas

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Innovation Actions

<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding
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Expected outcome:

In line with the European Green Deal’s zero pollution ambition, successful proposals will contribute to protect water quality by managing urban water pollution, and consequently also protecting biodiversity and the quality of aquatic ecosystems, as addressed by several impacts under 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:

- Enhancing urban water quality with a view of providing better guidance for policy making and prioritisation;
- Implementing sound, safer and risk-based urban water quality management plans supported by enhanced monitoring, advanced digital solutions, modelling and evidence-based scenarios
- Broad uptake of innovative and breakthrough solutions and technologies strengthening the competitiveness of the EU water sector and fostering the EU’s position and role in the global water scene.

Scope:

- Develop and demonstrate a European wide ‘whole system approach’ to address emerging water pollution and water quality assurance in urban areas and improve the resilience of urban water systems towards pandemics and global and climate change challenges;
- Develop and demonstrate advanced monitoring and control procedures, integrating risk management approaches and exploiting upgraded digital solutions to support urban water quality management;
- Integration and demonstration in an operational environment of new systemic concepts and holistic strategies to enhance urban water quality, including decentralised systems, hybrid green-grey infrastructures or cascading use of water;

Heading 3 – Addressing pollution in seas and ocean

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-ZEROPOLLUTION: Integrated assessment and monitoring of emerging pollutants

Specific conditions	
<i>Expected contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

Proposals are expected to contribute to all the following outcomes:

- Fill gaps in knowledge about the impacts and risks of contaminants of emerging concern (e.g., pharmaceuticals, endocrine disruptors) on marine ecosystems and marine biodiversity (including marine sediments and deep-sea ecosystems);
- Advance 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 and impacts on marine ecosystems and marine biota;
- Design and test solutions for integrated assessment and monitoring of the circulation and impacts of contaminants of emerging concern in marine environment, ecosystems and on marine biota including establishing monitoring protocols and ensuring sustained collection of data under FAIR principles.
- Develop tools and guidance to support the implementation of relevant EU policies (e.g. WFD, MSFD, EU Zero Pollution Action Plan for Air, Water and Soil)

Scope:

Contaminants of emerging concern including pharmaceutical products and contaminants found in personal care products are increasingly detected in surface and marine waters. 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. 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 monitoring of impacts of contaminants of emerging concern on marine environment, ecosystems and biodiversity. 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 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 occurrence and impacts of those contaminants on marine environment and marine biodiversity.

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 in EU pollution monitoring and assessment system in particular under the Water Framework Directive, Marine Strategy Framework Directive and under the EU Zero Pollution Strategy and Plan.

HORIZON-CL6-2024-ZEROPOLLUTION: A changing Arctic – pollution pressures in a climate change world

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

In line with the European Green Deal's zero pollution ambition and the EU Arctic policy, successful proposals will contribute to protecting Arctic ecosystems by analysing main pollution sources in a climate change context and examining ways to prevent or eliminate pollutants, consequently protecting biodiversity and the quality of aquatic ecosystems, as addressed by several impacts under Destination 'Clean environment and zero pollution'. This will also contribute to the work of the Arctic Council.

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

- Advance scientific understanding of the impacts of pollution, including ones linked to permafrost thaw and plastic pollution, and its interactions with the changing climate system, and understanding of the main ecological, socio-economic and health risks and challenges for the Arctic and the wider Earth System;
- Design solutions and pathways for ecological and societal mitigation and adaptation and related social transformation;
- Identify adaptation strategies for both ecosystems and human communities in relation to the changes in Arctic;
- Explore future pathways to minimise risks and linking with state-of-the-art climate change models and predictions and also coupling with socio-economic models.

Scope:

The projects are expected to deliver on:

Human induced pressures are affecting the unique Arctic ecosystems – while Arctic changes, in return, determine some extreme climate-related phenomena in the rest of the Northern hemisphere. Pollution is an increasing problem in the Arctic, both in terrestrial and marine ecosystems. Carbon emissions and in particular black carbon cause more damage in the Arctic than elsewhere because of polar amplification. Pollution from Arctic shipping and tourism relying on heavy diesel fuels induce greater ice melting and have negative effects on marine life.

At the same time, rising temperature induces thawing of permafrost and there is an urgent need to address the adverse effects of thawing permafrost and associated gas hydrates, which present risks for the environment and human activities:

- Greenhouse gases released from thawing permafrost threaten to cause irreversible changes in the Arctic and other regions;
- Infrastructure: thawing permafrost weakens infrastructure and increases coastal erosion. Over 70% of Arctic infrastructure and 45% of oil extraction fields are built on permafrost. Potential measures include developing devices and methods for local cooling and stabilisation, providing satellite data on subsidence and erosion in permafrost areas and setting tougher building standard;
- Risks to human, animal and plant health.

- Need to improve our understanding of long-distance transport of marine plastic litter in the North Atlantic and air transport of micro plastics, and their impact on local and indigenous communities as well as food systems and ecosystems.

Heading 4 – Increasing environmental performances and sustainability of processes and products

Proposals are invited against the following topic(s):

HORIZON-CL6-2023/2024-ZEROPOLLUTION: 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 EUR XX 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 XX million (XX M EUR 2023 / XX M EUR 2024).
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

Successful proposals will support researchers and innovators to improve the environmental performances and circularity of bio-based systems in industrial sectors in line with the European Green Deal and the EU zero pollution action plan. 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, restoring biodiversity and protecting air, water and soil quality along supply chain of biological feedstock and industrial value chains.

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

- Environmental performances of bio-based processes approaching the zero-waste, zero-pollution ambition.
- Integrated pollution prevention and control in bio-based systems targeting air, water and soil quality, noise levels.

Scope:

- Reducing exhaust flows from bio-based processes (including the ones that are usually not considered in the common pollution prevention and control: hot water, vapours and odours etc.) through innovative technologies of recirculation, fractionation, extraction, conversion etc.;
- Eliminating/minimizing hazardous substances;
- Re-circulating any process flow such as air/water/energy;
- Reducing any exhaust from the industrial installation, (including the ones that are usually not considered in the common pollution prevention and control: hot water, vapours and odours etc., to reach the zero-pollution ambition starting from the emissions;
- Reducing noise emissions;
- Maximizing circularity of 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;
- Develop operations of all scales, including the small scale (but with potentially high environmental impact);
- Piloting and validating digital innovation for bio-based processes, including data sharing platforms for the management of supply and value chains, as well as industrial symbiosis operations between biorefineries, industrial hubs, etc.

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.

HORIZON-CL6-2023-ZEROPOLLUTION: Safe-and-sustainable-by-design bio-based platform chemicals, additives or products as alternatives

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

In line with the European Green Deal's zero pollution ambition and the chemicals strategy for sustainability, successful proposals will contribute with innovation in bio-based safe-and-sustainable-by-design (SSBD) solutions, as alternatives for a variety of applications. Bio-based solutions should go also beyond chemicals/ compound considerations, with a reflection on end-use and final application(s). Projects are expected to contribute to:

- Enabling circularity(-by-design) of final products (via innovative use of diverse feedstock for alternative bio-based chemicals, additives, materials or products), especially in applications where recyclability is currently hindered or very challenging;
- Reduce the dependence or replace harmful additives, especially in materials and formulations, leading to safer (low human and environmental toxicity) final products;
- Build on a portfolio of promising bio-based solutions showing potential for scaled up/industrial production and market uptake of safer, circular and more sustainable products.

Scope:

- Scoping and identification of thematic priorities* (and priority end-use areas) where bio-based solutions could provide 'solid' solutions as safer and sustainable alternatives;

** Thematic areas could span across: 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),*

- Design and development of bio-based chemicals, additives or materials as alternatives for applications where substances of very high concern, persistent organic pollutants and legacy additives are currently used (e.g. textiles, plastics value chains);
- Embed functionality and value chain considerations for any novel solutions developed, providing equivalent or improved functional performance together with benefits in regards with safety and environmental performance.
- Integration of safe-and-sustainable-by-design criteria, guiding principles for all designed solutions. Similarly for the assessment of solutions, using appropriate SSBD methodologies. Note: there are synergies with HEU Cluster 4 and SSbD criteria are currently foreseen in SWD in Oct 2022.

HORIZON-CL6-2024-ZEROPOLLUTION: Environmental sustainability and circularity criteria for bio-based systems

Specific conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

Successful proposals will support traders and certification companies to tracing environmental impacts and circularity of bio-based systems in order to enable responsible production in the industrial bio-based systems in the EU, in line with the 2030 Climate Target Plan and the EU zero pollution action plan. Project outcomes will contribute to enhance circular bio-based systems.

Projects results are expected to contribute to the following expected outcome:

- Certification schemes for international trade at EU and global scale of bio-based materials and product include the environmental impacts and circularity along the value chains.

Scope:

The environmental sustainability and circularity assessment of bio-based systems are instrumental to guarantee and monitor that they are developed towards the just green transition of the EU economy. Such assessment would result and instrument for policy makers and for investors, to support the best performing bio-based sectors and to leverage investments and ensure competitive edge solutions.

Assessment of the environmental impacts should benefit to the greatest extent possible from, existing methodologies and indicators, which can be adapting if needed. Methodologies and indicators should use available environmental observations efficiently.

- Develop and improve the methodologies to assess environmental impacts on climate, biodiversity, water resources as priorities, but also on air, water and soil quality. Trade-offs should be included, as well, such as the carbon removal capacity of bio-based products.
- Metrics of circularity based on the application of the cascading approach of biomass use, the life-cycle assessment of resources efficiency, etc.
- Collect and analyse the performances references/benchmarks within the Union,

- Analysis of trade-offs and synergies with economic and social objectives (including geographical distribution aspects) and with competing and adjacent economy sectors: food, feed, bioenergy, biofuels, recreation and cultural services, or even urbanization pressures.
- Communication tools, exploiting the potential of digital solutions for product information,);
- Consult stakeholders, making use of existing for a for discussion;
- Improve existing/develop ad-hoc certification scheme for international trade at EU and global scale of bio-based materials and product;
- Demonstrate the full framework of the environmental sustainability and circularity assessment of bio-based systems in an operational environment;
- Develop and disseminate guidelines to targeted stakeholders.

Proposals' consortia should involve primary producers of biological resources, trade bodies, bio-based industries, agencies/companies developing certification, consumers' organisations and any stakeholder along the supply chain of biological resources for bio-based industries. 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.

HORIZON-CL6-2023/2024-ZEROPOLLUTION: Methodologies for assessing environmental and circular performances of processes and products underpinned by cutting-edge biotech and bio-based technologies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million (XX M EUR 2023 / XX M EUR 2024)
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

Successful proposals will support researchers and innovators to understand the environmental impacts and circularity of cutting-edge biotech and bio-based technologies to steer innovation

in the bio-based systems in the EU towards more environmentally sustainable solutions, in line with the 2030 Climate Target Plan and the EU zero pollution action plan. Project outcomes will contribute to enhance circular bio-based systems operating according to planetary boundaries.

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

- Methods to assess the environmental sustainability and circularity of low TRL bio-based technologies
- Orientations to research and innovation programmes in the bio-based sectors

Scope:

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 scale-up of the most promising bio-based technologies, including focussing on the potential environmental hotspots of the emerging technologies. Therefore, more efforts are necessary to find the effective modelling of the expected performances of low TRL bio-based projects, e.g. through the prospective LCA approach.

Proposals should deliver on:

- A review of “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 understand and classify the main challenges of prospective LCAs are identified, e.g. comparability of results, input data availability, uncertainties/robustness, etc.;
- Develop and improve the methodologies for the assessment of environmental sustainability and circularity performances of bio-based supply and value chains (i.e. principles and criteria relevant for bio-based systems, indicators of impacts) adapted to very low TRL bio-based technologies including modelling approach. Trade-offs should be included, as well, such as the carbon removal capacity of bio-based products.
- Modelling the tests to validate the developed methodologies, including in relevant environments for future R&I projects.
- Include the analysis of synergies and trade-offs with economic and social objectives (including geographical distribution aspects).
- Develop and disseminate guidelines to targeted stakeholders.

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.

HORIZON-CL6-2023-ZEROPOLLUTION: 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 EUR XX 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 XX million
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	The conditions are described in 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.

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

- Improved environmental sustainability, and safety, of industrial bio-based processes, aligned with the EU climate-goals and zero-pollution ambition of the European Green Deal, including by lowering the input requirements in terms of e.g. land use, feedstocks, water and energy, and by advancement of non-toxic / zero-pollution production processes.
- 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, lower/minimal dependence on scarce natural resources, especially in terms of biological feedstocks)
- 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 by contributing to improved governance⁵⁴ via dialogue with regulatory actors and supporting networks.

⁵⁴ See parallel topic HORIZON-CL6-2023-GOVERNANCE-xx-xx: Co-creation and trust-building measures for biotechnology and bio-based innovation systems

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 regulatory requirements, including related necessary technical aspects in other fields, such as cell sorting, automation, robotics, IT data innovations, or the ‘biofoundry’ concept.
- Environmental improvements and lowered impacts must 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 other HE Clusters, in particular Cluster 5.

HORIZON-CL6-2023-ZEROPOLLUTION: 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 EUR XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in 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.

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

- Improving the environmental quality by stepping up the reliable monitoring and detection, based on bio-based principles by developing practical, specific, adaptable and economic tools, for the use of consumers, inspection services and industry operators alike.
- Contributing to the zero-pollution objective of the European Green Deal by up-scaling the application of modern biosensors underpinned by the biotechnology, across a variety of 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.
- 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-based 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,
- (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,
- (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. All environmental conditions and ecosystems (water, soil, air etc), may be covered.

Heading 5 – Reducing the environmental impact and pollution in food systems

HORIZON-CL6-202X-ZEROPOLLUTION: Environmental impacts of food systems

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: Many food supply practices and consumption patterns still result in air, water and soil pollution, contribute to the loss of biodiversity and to climate change, and consume excessive amounts of natural resources, including water and energy, while a significant amount of food is wasted. In supporting the implementation of the Green Deal, the EU Zero Pollution Action Plan, the Farm to Fork Strategy and the Common Agricultural Policy successful proposals must address the following outcomes:

- Characterize the environmental impact categories related to soil, water and air pollution, including drivers of biodiversity losses in different food value chains such as food processing, packaging, transport, trade, retail, and household consumption.
- Identify and enable transition pathways to reduce environmental impacts related to air, water and soil pollution in food systems.
- Advise and empower policy decisions that promote uptake of environmentally friendly, resource- and energy-efficient food processing, manufacturing, packaging, retailing and consumption practices, aiming at reducing the environmental impact and taking into account the considerations of the Responsible Research and Innovation model.
- Identify challenges for a just green transition in different food supply-chain processes and of possible incentives for businesses to disclose food supply chain emissions of greenhouse gases and other pollutants and setting targets for resource and energy efficiency.

Scope:

Around one third of human-caused GHG emissions originate from the world's agri-food systems. In Europe, a similar share of emissions (EU 27 Member States range 25-42%) can be attributed to food sector.⁵⁵ According to a recent FAO study,⁵⁶ in the last 30 years, an increasing amount of food-related emissions are generated outside of agricultural land, i.e. in pre- and post-production processes along food supply chains. During this period, agri-food systems emissions increased in total by 17%, largely driven by a doubling of emissions from pre- and post-production processes. 5.8 billion tonnes of the 16.5 billion tonnes of GHG emissions from global total agri-food systems in 2019 came from supply-chain processes such as manufacturing of fertilizers, food processing, packaging, transport, retail, household consumption and food waste disposal.. Emissions of pollutants covered by EU legislation on air quality follow the same pattern.

⁵⁵ 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).

⁵⁶ Tubiello, F. N., Karl, K., Flammini, A., Gütschow, J., Obli-Layrea, G., Conchedda, G., Pan, X., Qi, S. Y., Halldórudóttir Heiðarsdóttir, H., Wanner, N., Quadrelli, R., Rocha Souza, L., Benoit, P., Hayek, M., Sandalow, D., Mencos-Contreras, E., Rosenzweig, C., Rosero Moncayo, J., Conforti, P., and Torero, M.: Pre- and post-production processes along supply chains increasingly dominate GHG emissions from agri-food systems globally and in most countries, *Earth Syst. Sci. Data Discuss.* [preprint], <https://doi.org/10.5194/essd-2021-389>, in review, 2021.

Since ensuring sustainable primary production systems (e.g. improving organic farming, reducing the use of pesticides) is covered in Destination ‘Fair, healthy and environment-friendly food systems from primary production to consumption’, this topic will focus on post-production processes along the food supply chains and will:

- investigate possible tools and methodologies for measuring environmental impacts related to water, air and soil pollution, as well as resource and energy efficiency in food value chains such as food processing, packaging, transport, trade, retail, and household consumption.
- elaborate possible transformation pathways leading to reduced environmental impacts across post-production food value chain processes.
- provide an analysis of the readiness of food supply actors and the main challenges to change post-production food supply chain processes. build upon the European Green Deal Call topic related to testing and demonstrating systemic innovations for sustainable food from farm to fork.
- investigate new modelling approaches, undertake foresight analysis and research on consumption patterns,
- provide policy options for policy makers, both in government and within the food industry sector.
- focus on innovative systemic solutions that maximise synergies among the three dimensions of sustainability (climate/environmental, economic, social/health) and minimise trade-offs in post-production processes along the food supply chains.

HORIZON-CL6-202X-ZEROPOLLUTION: Strategies to reduce plastic pollution from the food system

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: In supporting the implementation of the European Green Deal, the new circular economy action plan, and the Farm to Fork Strategy, successful proposals must address the following outcomes:

- Provide strategies and tools for packaging producers and food business operators to reduce the amount of plastic food packaging, increase the reuse and recycling of packaging materials and adopt increasingly sustainable and efficient fit-for-purpose packaging solutions in the food sector.
- Identify the challenges of integrating the need to reduce single use plastic in food packaging at the level of the conception of the product.
- Provide strategies tools aimed at improving consumer acceptance of efficient, sustainable and fit-for purpose packaging solutions, facilitate the use of reusable and recyclable packaging for consumers, ease sorting and appropriate disposal of packaging, and help them to correctly interpret labelling of packaging.
- Ensure wider social benefits of innovative approaches aiming at reduction of plastic food packaging.

Scope:

The use of single-use plastics in food packaging has grown significantly in the last decades, leading to increased pollution in the environment. . While for some perishable foods plastic packaging prolongs product life, reducing waste, there is a need to improve the sustainability of food systems, which includes also the development of more environmentally friendly food packaging, reduction of excessive packaging and disposal of packaging waste. This topic will:

- Develop strategies and innovative approaches for packaging producers and food business operators, with the aim to reduce the amount of food packaging waste (particularly plastic) at the level of the conception of products; increase the reuse and recycling of packaging materials; and adopt increasingly sustainable and efficient fit-for-purpose packaging solutions, which take into account the environmental impact as well as safety and maintains high-quality of foods.
- Analyse the barriers of integrating the need to reduce single use plastic in food packaging at the level of the conception of products.
- Support social innovation as a means to reduce plastic food packaging by choosing sustainable alternatives, improving collection, reuse and recycling of plastic packaging.

Provide an analysis of the readiness of food packaging producers and the main challenges to change packaging practices.

Destination – Land, ocean and water for climate action

Reducing GHG emissions and enhancing carbon sinks in primary production and natural systems as well as in harvested wood products and other carbon storage products are key elements of the European Green Deal⁵⁷. Achieving sustainable ocean, water and land management, and an efficient use of natural resources that foster climate change mitigation 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** states that, for reaching 2030 and 2050 climate targets and for biodiversity restoration, the EU needs to immediately and decisively restore and grow its natural carbon sinks. The Commission proposed in 2021 to amend **regulation (EU) 2018/841 for land use, forestry, and agriculture** by setting an increased Union 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 fertilizer use. The Commission published in the end of 2021 a **communication on sustainable carbon cycles**, including **carbon farming and certification of carbon removals**. R&I, new technologies and business models are expected to unlock the full potential of LULUCF activities in the mitigation of climate change.

Implementation of carbon farming will be facilitated in line with the communication on sustainable carbon cycles. R&I activities under this destination, and in the work programme year 2022 of the mission “a soil deal for Europe” will **support the coordination** of the research community and key stakeholders on **developing, testing and demonstrating carbon farming practices and certification of carbon removals**. Results of funded activities will benefit land and forest management and the delivery of multiple services provided by agricultural land and forests, such as the provision of goods and long-term carbon storage in harvested wood products, development of paludiculture on restored peatlands and wetlands, the protection of soils, water and biodiversity and finally climate change adaptation and mitigation.

Specific attention will be given to paludiculture, complementing activities of Cluster 5 in work programme 2021/2022. R&I activities will support enhancing soil organic carbon; protecting carbon-rich soils (e.g. grasslands and peatlands); restoration of peatlands and wetlands; improved advisory services for land managers. Together with work programme of the mission “a soil deal for Europe” R&I activities will aim to reduce the financial burden resulting from the costs of carbon farming management practices and the uncertainty about revenue possibilities. In the livestock sector, R&I on manure management will contribute to the **implementation of the EU methane strategy**⁵⁸. R&I activities will also foster forests' contribution **as natural and man-made carbon sink** and maintaining multiple ecosystem

⁵⁷ Commission Communication on the Green Deal (COM(2019) 640)

⁵⁸ https://ec.europa.eu/energy/sites/ener/files/eu_methane_strategy.pdf

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 an integral part 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. Main expected outcomes are an improved understanding of the role of the ocean in the Earth Climate System by closing the research gaps on ocean essential climate variables and improved ocean models for seasonal to decadal forecasting at local to 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 of carbon. R&I will advance knowledge innovations to foster ocean-based solutions/mitigation options, helping to close the emissions gap and halting of the ocean acidification and consequent biodiversity losses.

The following blue carbon ecosystem developments could be envisaged: more knowledge on identification of regions at risk; explore, preserve, restore or even create new natural habitats, and provide solutions to enhance 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, for example on coastal wetlands, as well as seaweed and mollusc aquaculture. Biodiversity protection plays an important role in all approaches for mitigation through ecosystems and NbS are of high importance 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 building on the latest developments at COP26, the science on the climate and the ocean nexus developed under the Horizon Europe programme will contribute and inform the dialogue under the UNFCCC on the ocean and climate change.

Other major contributions will be made by contributing new scientific knowledge on polar regions for the **EU Arctic policy**; supporting the new policy initiative on **sustainable blue economy** and its offshoot initiatives, implementation of **Marine Strategy and Water Framework Directives**; contributing to the **clean planet for all's** aim for a planet where all major threats to the planetary ecosystem health are neutralised.

In accordance with the **climate adaptation strategy**⁵⁹, climate action calls also for **fostering adaptation to climate change** of ecosystems, primary production, food systems and the bioeconomy. 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 impacted by variable and extreme weather events, which may at the same time lead to desertification. Agriculture and forestry in the EU are vulnerable to climate change. There is in particular growing evidence about the effects of climate change, and of extreme weather events, on agricultural production and crop yields, which need to be mitigated, and also on the forest sector. In the area of forestry, R&I will improve the knowledge on the interactions and interdependencies between biodiversity and climate change and identify win-win management strategies, addressing also trade-offs in sustainable manner. Marine and coastal areas are also threatened by sea level rise, saline water

⁵⁹ XXXX

intrusion, biodiversity loss, ocean acidification, extreme events and a shrinking cryosphere. R&I will, therefore, be critical to foster adaptation and build resilience in agriculture, forestry, and activities in marine and coastal areas. They will aim to deliver on the urgent need to foster 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 and to deliver sustainable nature-based solutions that will also increase carbon sequestration, natural water retention, biodiversity conservation and restoration, enhance coastal protection, reduce the risks of algal blooms and offer ecotourism opportunities. Water adaptation strategies and approaches will be developed and tested. In this context the innovation potential for avoiding possible negative environmental impacts of a wide range of alternative water solutions (e.g. rainwater harvesting, storm water collection, water reuse and reclamation, brackish and sea water desalination, aquifer recharge, etc.) 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 enhancing soil fertility, increasing carbon storage in soils and biomass, benefitting agricultural productivity and food security and reducing biodiversity loss. R&I will also aim at better understanding how institutions and behaviour shape vulnerability and offer opportunities for adaptation.

Expected outcomes include as part of international cooperation, exchange of knowledge/reports and joint use of datasets and technologies on joint adaptation, mitigation and biodiversity reporting and monitoring on land contributing to the overall domains targeted in Cluster 6⁶⁰.

Expected impact

Proposals for topics under this destination should set out credible pathways contributing to **climate action on land, including forestland, grassland, cropland and wetland, ocean and water** and more specifically to one or several of the following impacts:

- Better understand and enhance the **mitigation potential of ecosystems and sectors based on the sustainable management of natural resources**;
- Advance science and technology to support **adaptation and resilience of natural and managed ecosystems**, on land, in the ocean, in water and soil systems and economic sectors in the context of the changing climate, including its interaction with drivers of biodiversity change and zero pollution;
- 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;
- Foster **climate change mitigation in the primary sectors**, including by the reduction of their GHG emissions and other pollutants, maintenance of **natural and man-made**

⁶⁰ This refers to potential cooperation EU-China.

carbon sinks and enhancement of uptake and storage of carbon in ecosystems, taking into account trade-offs with regard to ecosystems;

- Improve the **adaptive capacity to climate change** of the ocean, sea, water and soil systems and sectors, including by unlocking the potential of nature-based solutions;
- **Sustainably manage scarce resources**, in particular soils and water, thus mitigating climate related risks, in particular desertification and erosion, thanks based onto informed decision-makers and stakeholders and integration of adaptation measures in relevant EU policies.

Proposals are invited against the following topic(s):

HORIZON-CL6-2023/2024-CLIMATE: 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 between EUR XX and XX 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 XX 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>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>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. 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.</p>

<i>Total indicative budget</i>	The total indicative budget for the duration of the partnership is EUR XX million
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Expected outcome:

In support of the European Green Deal and EU water-related policies, the successful proposal will contribute to foster the adaptation of water resources to climate change, contributing therefore to Destination ‘Land, ocean and water for climate action’ impact “Advance the understanding and science, and support adaptation and resilience of natural and managed ecosystems, water and soil systems and economic sectors in the context of the changing climate”, as well as preserve and restore ecosystems and biodiversity, prevent pollution in land and seas, enhance food security, foster sustainable and circular management of water resources and innovative governance.

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

- Increased protection of water resources and ecosystems and strengthening of biodiversity, by developing a more systemic and integrative policy which considers cross-sectoral interactions (water, biodiversity, agriculture, fisheries and aquaculture, energy, health).
- Enhanced resilience, mitigation and adaptation of water systems to climate change and multiple interacting stressors.
- Pooled resources (EU, Member States, Associated Countries, European platforms and economic sectors) and alignment within a shared and co-developed strategic research and innovation agenda (SRIA) and related implementation plans and better embedding of national and regional knowledge and innovation ecosystems within that of the EU.
- Leverage impacts of policies on the water security crisis, by upscaling projects (from research to demonstration) and supporting policy implementation based on cooperation, across stakeholders and sectors.
- Strengthened alignment between funders’ programmes and timelines and knowledge transfer, and addressing the lack of continuity of funding from research to implementation and difficulties in securing long-term investments.
- Greater cooperation across sectors, with multi-stakeholder engagement and empowerment, to co-develop and co-implement solutions and to drive the necessary societal transformations required for securing water for all.
- Reinforced role of the EU in the international water agenda (implementation of UN SDGs) and in strengthening water diplomacy.
- Science and evidence-based implementation of the European Green Deal and EU water related policies.

Scope:

Water resources are vital for all human activities and the environment. Ensuring that enough water of high quality is available for all purposes remains a key challenge globally and within Europe.

Global trends project world-wide growth in water use by 55% by 2050, due to growing demands from manufacturing, thermal electricity generation, agriculture and domestic use, all increasing the pressure of human activities on our freshwater resources. Furthermore, water quality is declining due to agricultural, industrial, mining and urban pollution, impacting the availability of water of sufficient quality for users. According to the recently released Global Assessment by the Intergovernmental Platform for Biodiversity and ecosystem services (IPBES), freshwater biodiversity is declining rapidly. Hydrological extreme events, such as floods and droughts, are going to increase, according to the latest IPCC conclusions, exacerbating the water crisis and impacts across all economic sectors.

Achieving good status of Europe's surface waters and providing enough water for all, is not only important for the implementation of EU water related policies, it is also an essential element for achieving other EU related policies, such biodiversity, agriculture, climate and energy related policies. Water is also central to all components of the European Green Deal.

There is, therefore, a need to produce science-based knowledge to support the European Green Deal and other EU policies by monitoring problems related to water and developing feasible technical and managerial solutions.

Water is a dedicated UN Sustainable Development Goal (namely SDG6) but it will not be achieved by 2030 at current rates, considering trends in financing, capacity and political commitments. This will also undermine progress towards most of the other SDGs, particularly the goals related to poverty, hunger, health, clean energy, cities, climate, life below water and life on land, but also gender equality and peace, which are all related to water.

The diversity of challenges we are now facing to secure water for all, requires a new co-funded partnership that brings together all public and private research funders and supports a more efficient collaboration and integration of EU, Member States and Associated Countries R&I activities related to water. This will ensure a transition to a healthy planet, respectful of planetary boundaries, a resilient Energy Union, and implementation of an EU policy of climate-neutrality, in line with Horizon Europe priorities.

It also requires the alignment and/or integration of different research and innovation agendas and of EU and national programmes, coordination of funding agencies and commitments to implement a long-term strategy that would deliver major changes and impacts. Based on a shared and co-constructed SRIA, such a partnership should combine bottom-up and top-down approaches to reconcile needs whilst pooling resources from different sources. It should foster consortium building and help leverage between existing initiatives under common broader or specific objectives. This will give direction and shape to a common water implementation strategy.

A European partnership is also necessary to deliver an objective and impact-driven approach and build critical mass in resources (human and financial), expertise and capacities in the longer-term, in line with the challenge faced. This would allow for the mobilisation of additional national resources with access to other instruments / financing / investments along the same strategic research agenda (e.g. real-life testing sites, research infrastructures, and innovation hubs or competitiveness clusters), contributing from collaboration that benefits existing European, national and local ecosystems.

Tackling the global challenges also requires different forms of cooperation (to maximise the types and number of partners involved). This would allow implementation of a larger range of types of actions, such as development of academic and applied research, innovative solutions, including collaboration with enterprises in projects, transfer of innovation to enterprises, addressing the science/policy interface, while having better access to research infrastructures and connections to implementation tools (financial, regulatory), demonstration and training.

The co-funded European Partnership Water Security for the Planet (Water4All) should address the following vision: “Boosting the systemic transformations and changes across the entire research – water innovation pipeline, fostering matchmaking between problem owners and solution providers to ensure water security for all in the long-term”.

Water4All should propose a portfolio of multi-national, multi-faceted and cross-sectoral approaches, encompassing policy, environmental, economic, technological and societal considerations to enable water security for all in the long-term. It should therefore be implemented through a joint programme of activities ranging from research and innovation programme coordination to new knowledge and innovation development, transfer to policy-making, operational implementation and demonstration of the efficiency of solutions. It should be structured according to the following pillars:

- Identify research and innovation priorities to strengthen alignment of EU and national RDI programmes and increase the impact and policy relevance.
- Develop new knowledge and innovative solutions for a systemic and inclusive approach to water challenges at operational scale (e.g. river basin, water catchment).
- Transfer knowledge and innovation to i) policy-makers and ii) operators / managers so that they are able to implement the proposed solutions.
- Demonstrate the efficiency and the sustainability of the proposed solutions at local level, in close cooperation with the relevant actors (including policy-makers and decision makers).
- Increase and strengthen international cooperation to develop a critical mass in relation to the global challenges faced.

This will create a continuum from the identification of the challenges to the demonstration of proposed solutions, ensuring a more rapid translation of research and innovation into concrete applications and uptake by relevant managers and citizens.

Water4All should rely on a core group composed of R&I programme owners and funders from ministries in charge of R&I policy and agencies, policy makers from ministries in charge of environmental policy and environmental / water protection agencies, from the EU, neighbouring countries and beyond the EU, as core members, in close cooperation with a wide range of other research and economic actors (multinational corporations, suppliers & SMEs, research & technology developers, water utilities, civil society organisations). Partners are expected to provide financial and/or in-kind contributions for the governance structure, the joint calls, and other additional activities. To achieve the international cooperation objectives, collaboration with non-European countries is strongly encouraged.

The partnership is open to all EU Member States, as well as to countries associated to Horizon Europe and will remain open to such countries wanting to join.

To ensure the coherence and complementarity of activities, and to leverage knowledge investment possibilities, the partnership is expected to foster close cooperation and synergies with other ongoing EU and nationally funded R&I activities, the Horizon Missions on Healthy Soils; on Ocean, seas and waters; on Climate Adaptation and on Cities, relevant Horizon Europe partnerships (Chemical Risk Assessment, Driving Urban Transition, Waterborne, Biodiversity, Blue Economy, Safe and Sustainable Food System, Agro-ecology living labs) and other programmes/initiatives (such as Cohesion Policy funds, LIFE programme, COST actions, Development and International Cooperation funds, ESA/Copernicus, KIC Climate, PRIMA, follow-up of BONUS). Proposers are expected to describe in details the way to implement such collaborations.

Proposals 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 programme(s) to continue providing support to the partnership for the duration of Horizon Europe.

HORIZON-CL6-2023-CLIMATE: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	RIA

<i>Eligibility conditions</i>	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 foster the adaptation of water resources to climate change, in particular Destination ‘Land, ocean and water for climate action’ impacts “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 the following expected outcomes

- Provide recommendations on alternative water resources options in water scarce areas to address current and future challenges to water supplies
- Help decision makers to integrate alternative water resources supply technologies in their strategic plans for water resources management taking into commiseration the relevant EU regulatory frameworks
- Increase the societal awareness, acceptability and trust of several alternative water supply resources for different societal, environmental and economic water use
- Increase the market potential of alternative water resources

Scope:

- Improve the efficiency, reliability and cost-effectiveness of a wide range of alternative water solutions (e.g. rainwater harvesting, storm water collection, water reuse and reclamation, brackish and sea water desalination, aquifer recharge, etc.) in the context of climate change and water scarcity.
- 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 interaction. s
- Assess their innovation, climate mitigation and adaption potential and their environmental and health impacts and explore the potential of digital technologies for appropriate data collection and integration. Attentions should be given in 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 WFD requirements.

HORIZON-CL6-2023-CLIMATE: 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 between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the proposals attain all thresholds.

Expected outcome:

Successful proposals will 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, production systems at sea, in coastal areas, where adaptations to climate change are also being fostered for enhanced resilience. Specifically, successful proposals will contribute to:

- Explore, better understand and enhance the mitigation potential of ecosystems based on the sustainable management of natural resources;
- Advance the understanding and science to support adaptation and resilience of natural and managed marine and polar ecosystems in the context of the changing climate;
- Foster climate change mitigation by the maintenance and enhancement of natural carbon sinks and stocks while preserving or enhancing biodiversity in ecosystems;
- Better understand the impact of climate change on fresh water (including the associated ecosystems) and improve the adaptive capacity of ocean systems and sectors, including by unlocking the potential of nature-based solutions.

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

- Mitigation opportunities of newly emerging European and polar blue carbon habitats uncovered;
- Closed knowledge gap for enabling their inclusion and accounting in NDCs and NAPs;
- Significant contributions made to the implementation of the European Green Deal and global scientific assessments.

Scope:

Actions should aim at developing innovative approaches to address only one of the following options:

A. European and polar blue carbon hotspots and priority areas for climate policy frameworks and effective management (TRL 3-5)

The project is expected to:

- Map European and polar blue carbon hotspots and priority areas;
- Monitor, evaluate and quantify carbon fluxes and stocks and evaluate current trends & improve model skills and predictions;
- Gather carbon information on stocks and accumulation, carbon characteristics (source, lability), change under pressures from human activities;
- Identify and recommend best suited, fit-for-purpose, climate resilient and locally informed actions to protect, sustainably manage, restore, and enhance these blue carbon habitats;
- Identify the status, costs, potentials, risk & impacts, co-benefits, trade-offs and spill over effects, and role in mitigation pathways;
- Identify and quantify the impact of anthropogenic induced activities that lead to the disturbance, destruction and degradation of these habitats;
- Make policy recommendations.

B. Uncover mitigation opportunities of newly emerging European and polar blue carbon habitats (TRL 1-3)

The project is expected to:

- Conduct exploratory research into potentially new habitats emerging;
- Gather carbon information on stocks and accumulation, carbon characteristics (source, lability);

- Identify and recommend best suited, fit-for-purpose, climate resilient and locally informed actions, initiatives and activities to protect, sustainably manage, restore, and enhance these blue carbon habitats;
- Assess impact of anthropogenic induced activities that lead to the disturbance, destruction and degradation of these habitats.

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HORIZON-CL6-2024-CLIMATE: Improve irrigation practices and technologies in agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	IA
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B.</p> <p>The Joint Research Centre (JRC) may participate as member of the consortium selected for funding</p> <p>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 support of the European Green Deal, in particular the farm to fork strategy and EU water-related policies (notably the water framework directive), and the work done and data available by the European Environmental Agency (EEA), successful proposals will contribute to increase the resilience of agriculture with innovative irrigation systems that increase efficiency in water management.

Projects results are expected to contribute to the following expected outcomes

- Provide solutions and tools for improve water management in particular in areas of in water scarcity to anticipate solutions for current and future challenges in water management
- Support end-users to uptake innovative solutions in irrigation technologies
- Unlock the potential of recycling of sewage sludge and other biowaste streams as alternative water supply resources for agriculture
- Increase the socioeconomic and environmental potential of alternative irrigation practices
- Reduce agricultural water demand, by optimising irrigation systems including new opportunities for alternative supplies

Scope:

- Improve the understanding of the composition, potential for irrigation in terms of efficiency, reliability and cost-effectiveness of sewage sludge and other biowaste streams provided a safe use of these recycled products, without impact on the environment, ensuring a high agronomic efficiency of the nutrient they contain.
- Integration of land use and water management, optimizing catchment based agriculture production, reducing runoff patterns and possible changes in hydrological cycles links to climate conditions
- New or improve tools for an efficient combined use of water and fertilizers via irrigation for different agricultural systems including agro-ecology, organic production, conventional or intensive agriculture.
- New innovative forms of alternative water for agriculture and its socioeconomic and environmental and health impacts, i.e. solid water
- 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.

HORIZON-CL6-2023-CLIMATE: 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 up to EUR XX 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 XX million.
<i>Type of Action</i>	CSA (or RIA)
<i>Eligibility conditions</i>	XX

Expected outcome: 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 and adaptation to climate change and help achieve climate-neutrality by 2035 (land use) and 2050.

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

- Expand the knowledge base of climate related practices, resulting in increased application of climate-neutral farming approaches, assessing and evaluating different methods with all relevant actors involved;
- Speed up involvement 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. In the long-term, this will support a more substantial contribution of the farming sector to mitigation of GHG emissions and to carbon storage;
- Increased involvement of Member States' and Associated Countries agricultural knowledge and innovation system (AKIS) in climate-related farming issues, including through linking to the European innovation partnership "agricultural productivity and sustainability" (EIP-AGRI) national / regional / local projects and to research stations, with a view to wider dissemination and interaction within the Member States.

Scope:

A wide adoption of practices contributing to mitigation of climate change and 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 at the G-20. In particular, the engagement of farmers in this effort needs to be increased. Therefore, a strong involvement of Member States' AKIS is needed, as well as the development of targeted advice to farmers on climate issues.

The 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 Associated Countries [Name of the Project]. 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 adaption / mitigation of climate change in agriculture;
- Exploit existing and develop new solutions 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, performance monitoring, decision tools, climate services, etc. for possible use on average farms;

- Support the implementation of the EU carbon farming initiative as part of the Communication on “Sustainable Carbon Cycles”: carbon farming techniques and their outcomes, also in terms of better farm management; costs of carbon farming management practices and revenue possibilities; monitoring, reporting and verification systems; facilitate knowledge exchange on 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;
- Link the research stations into an EU network including all Member States to stimulate effective cross-fertilisation among Member States;
- Proposals should include a task to collaborate with [name of the project] funded by topic HORIZON-CL6-2021-CLIMATE-01-04 and project of 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.

HORIZON-CL6-2023-CLIMATE: Pilot network of climate positive organic farms

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to EUR XX 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 XX million.
<i>Type of Action</i>	CSA or RIA
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected Outcome: 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. Project implementation is expected to contribute to mitigation of and adaptation to climate change and help achieve

climate-neutrality by 2035 (land use) and 2050. It will also contribute to meeting the target of the Farm to Fork Strategy of reaching 25% of the EU's agricultural land under organic farming by 2030, as well as to implementing of the Action Plan for the Development of Organic Production.

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

- Enhanced capacity of organic holdings to mitigate of and adapt to climate change;
- Qualitative and quantitative data availability of the climate-related benefits and impacts of organic production, contributing to building the knowledge base for EU policy design and implementation and to increasing consumer awareness of the benefits of organic production;
- Development of carbon farming in the organic farming sector;
- Strengthened agricultural knowledge and innovation system (AKIS) in the organic sector on climate adaptation and mitigation.

Scope:

- Project will establish a pilot network of commercial certified organic farms and research stations representative of the main organic farming production systems and regions in the EU. Both crop (arable and permanent) and livestock sectors should be covered;
- Provide for the collection at farm and landscape level of data relevant to organic farming and to climate change;
- Support, in the organic sector, the implementation of the EU carbon farming initiative as part of the Communication on “Sustainable Carbon Cycles”, including on carbon farming techniques and their outcomes, also in terms of better farm management; costs of carbon farming management practices and revenue possibilities; monitoring, reporting and verification systems; facilitate knowledge exchange on and support tailored training and advisory services;
- Enhance knowledge and best practice sharing on adaptation and mitigation of climate change in the organic sector, with attention to regions where the organic sector is less developed;
- Establish links with topics / projects on a demonstration network for climate smart farming as well as with the planned partnership on agro-ecology living labs and with the mission “A Soil deal for Europe”.

HORIZON-CL6-2023-CLIMATE: Socio-economic aspects of paludiculture

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: this topic will support the European Green Deal notably its climate objectives and the EU Nature Restoration Plan 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 to reach EU climate objectives thanks to the conservation and restoration of typical ecosystems. To reach climate goals, rewetting of 500 000 hectares will be necessary in Europe. This topic will look into the potential of such areas when used for paludiculture.

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

4. Better knowledge of the existing systems of paludiculture and their potential to provide remunerating economic activities, while addressing climate mitigation and nature conservation objectives;
5. Estimate of the potential of conversion of currently degraded peatlands and wetlands, currently used for conventional agriculture (with drainage) to paludiculture;
6. Analysis of barriers, possible incentives through carbon farming and trade-offs.

Scope:

- Take stock of the main socio-economic variables of the sector and establish a databases / observatory for analytical purposes, covering the whole supply chain;
- Carry out analytical socioeconomic analyses, including projections and foresight;
- Analyse the policy environment and attitudes / values of farmers and other actors so as to find solutions to lift possible lock-ins and speed up the development of paludiculture;
- Support the EU approach with carbon farming regarding wetlands / peatlands and their restoration;
- Support social innovation solutions to facilitate the development of paludiculture (collective approaches, etc.);
- Support the establishment of a network at European and global level;

- This topic should build on the results of 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”;
- Strong involvement of SSH.

HORIZON-CL6-2023-CLIMATE: Energy prices and farming

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected Outcome: In supporting the implementation of the Green Deal, in particular its climate law and the EU 2030 biodiversity strategy, the farm to fork strategy and the common agricultural policy, R&I is expected to support agriculture and forestry pathways towards production systems adapted to new climate conditions.

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

- Better capacity of farming sector to cope with energy price variations and to decrease its dependence on fossil energy;
- Better analytical tools and capacity to integrate energy use in modelling.

Scope:

- Project will use foresight to elaborate scenarios of energy use / fossil use evolution and dependence. Reference scenarios of the European Commission (DG ENER) will be used and project will advance state of the art;
- Improve the capacity of models to take into account energy uses and prices. The possible participation of the JRC in the project will ensure that the approach proposed will be compatible with and improve the tools used at the European Commission;
- Analysis will cover both macro and micro levels. At the micro-economic level linkages will be established with the Farm Sustainability Data Network (FSDN) under development at the European Commission;

- Strong involvement of SSH.

HORIZON-CL6-2023-CLIMATE: Enhancing the sustainable production of renewable energy at farm-level

Specific conditions	
<i>Expected contribution per project</i>	<i>EU</i> The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: 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.

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

- Development of replicable, scalable production and business models to reduce greenhouse gas emissions by at least 55% by 2030 and ultimately achieve net-zero greenhouse gas emissions by 2050.
- Identification of technical, economic, societal and regulatory barriers hampering further scale-up of renewable energy at farm-level and development of suitable solutions to increase the up-take in practice.
- Recommendations for improved and targeted incentives and policies at regional, national and EU-level to reduce financial risks for farmers.
- Diversification and enhancement of agricultural incomes (organic and conventional farming)

Scope

- Assess the opportunities and barriers for different renewable energy technologies, identify synergies and trade-offs between various technologies and energy sources in view of the sustainable management of agricultural land and the co-production of food and feed.

- Develop innovative business models for farmers producing renewable energy, including direct feeds to the electricity grid or collective sales approaches that could potentially enhance profitability for farms.
- Analyse the potential of smart energy systems in rural areas and take into account 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) and grid stabilisation.
- Address, if applicable, the nutrient recovery as well as the overall minimisation of environmental impacts in the context of good agricultural practices and possible sanitary implications.

HORIZON-CL6-2024-CLIMATE: Paludiculture: large-scale demonstrations

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to XX EUR 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 XX million.
<i>Type of Action</i>	Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcome:

this topic will support the European Green Deal notably its climate objectives and the EU Nature Restoration Plan 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 to reach EU climate objectives thanks to the conservation and restoration of typical ecosystems. To reach climate goals, rewetting of 500 000 hectares will be necessary in Europe.

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

- Demonstration of the development of paludiculture and development of pathways for the conversion of degraded organic soils to paludiculture.
- Recommendations for the approach to be taken in view of large-scale deployment.

Scope:

- Project will establish large-scale demonstration in three areas of at least 50 hectares each;
- Project will adopt a living lab approach to involve all necessary actors (farmers, scientists, advisors, local governance, industry, etc.);
- Project will establish links with project supported through topic “HORIZON-CL6-2023-CLIMATE: Socio-economic aspects of paludiculture”.

HORIZON-CL6-2024-CLIMATE: Readiness of farmers to change production to adapt

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: In supporting the implementation of the Green Deal, in particular its climate law and the EU 2030 biodiversity strategy, the farm to fork strategy and the common agricultural policy, R&I is expected to support agriculture and forestry pathways towards production systems adapted to new climate conditions.

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

- Support the adaptation of EU agriculture and forestry to climate change thanks to better understanding of the challenges and their magnitude and the readiness of the sector to change;
- Move towards more environmentally-friendly production systems;
- Provide tools for decision-makers at EU and national levels to speed up the transition.

Scope:

The projects will:

- Map the main future climatic conditions in the EU, such as droughts; water scarcity; floods; fires risks; insufficient cooling temperature in winter, that will hamper EU farmers and foresters to continue their current activity by 2030/2035 up to 2040/2050;

- Elaborate typical transformation pathways, from today to 2050, leading to farming production systems adapted to new climatic conditions, where relevant foresight should be used;
- Analyse major constraints to change, including importance of assets. Provide an analysis based on SSH and more particularly on behavioural science of the readiness of farmers and foresters to change their production system;
- Analyse macro-economic consequence of necessary changes in the medium to long-term;
- The projects will build on environmental and socio-economic data.

HORIZON-CL6-2024-CLIMATE: Land use change and local / regional climate

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of up to EUR XX 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 XX million.
<i>Procedure</i>	To ensure a balanced portfolio covering the main EU regions, grants will be awarded to applications not only in order of ranking but at least also to the project that is the highest ranked for Northern Europe and to the project that is the highest ranked for Southern Europe, provided that the applications attain all thresholds.”
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	XX

Expected Outcome: 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 and adaptation to climate change and help achieve climate-neutrality by 2035 (land use) and 2050.

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

- Better capacity to understand the relations between land use and land use change and local / regional evolution of climate;
- Development of strategies at regional level to deal with adverse changes of climate;
- Following aspects would be covered: afforestation, edges, agro-forestry, etc.

Scope:

Project will:

- Analyse, model and project impact of land use and land use change on the local evolution of climate;
- Develop strategies to mitigate adverse evolutions of climate at the regional / landscape level and propose solutions;
- Special attention should be paid to rural areas. One project will focus on Northern regions and one on Southern regions. Project proposals should include a task to collaborate with other projects financed under this topic.

HORIZON-CL6-2024-CLIMATE: 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 between EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	Multi-actor approach The conditions are described in General Annex B.

Expected outcomes: This topic will support the European Bauhaus initiative and the implementation of the new EU Forest Strategy by 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 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 the climate change mitigation, a toxic-free environment and rural development objectives
- Development of pathways for an efficient conversion of solid biomass into forms of long-term carbon storage
- Increased resource efficiency, circularity and minimisation of environmental footprint

Scope:

- Analyse the potential market for hardwoods, damage wood and post-consumer wood in woody biomass-based construction products.
- Design wood-based building blueprints based on these products, taking into account the reuse, adaptability, zero pollution and healthy living environment into the design.
- Consider the human health and wellbeing, as well as the cultural traditions and customs, as integral elements of the built space.
- Analyse 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-based construction sector in Europe.
- Engage with relevant stakeholder in co-creation processes (e.g. policy, architects, business, insurance, investment, society, public and private sector).
- Link with other selected proposals and establish an open-access wood-based construction observatory in Europe, to monitor and update progress, statistics, good practice guidelines and solutions on wood-based construction.

HORIZON-CL6-2024-CLIMATE: Closing the research gaps on ocean essential climate variables (ECVs) in support of global assessments (IPCC, WOA, IPBES, and UN Decade)

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. To ensure a balanced portfolio, grants will be awarded to applications not only in order of ranking but at least also to those that are the highest ranked within set topics, provided that the proposals attain all thresholds.

Expected outcome: Successful proposals will 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 the changing climate;
- Efficient monitoring, assessment and projections related to climate change impacts, mitigation, and adaptation potential to bring out solutions for tackling emerging threats and support decision-making in climate change mitigation and adaptation policies at regional, European and global levels.

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

- Further developed climate models to represent and include key physical, biogeochemical and biological processes in the ocean;
- Better understood links between ocean physical and biogeochemical variability, and the impacts of stressors on ocean health, GHG sources and sinks, biology and ecosystems;
- Further developed key ocean monitoring indicators in compliance with international programmes and the ocean essential climate variables that support international global assessments and a regional approach to it;
- Significant contributions made to the implementation of the European Green Deal and global scientific assessments.

Scope:

Actions should aim at developing innovative approaches to address only one of the following options:

- A. Improving the understanding, measurement, climate projections and predictions of key physical oceanic climate processes (sea surface temperature, sea state, surface stress, sea ice, ocean surface heat flux, sea surface salinity, surface currents, sea level, subsurface temperature, subsurface currents, subsurface salinity) at regional or sea basin scale and their connectivity with /impact on biogeochemical processes (including different forms of carbon, GHG)

The project is expected to:

- Further develop the key physical ocean monitoring indicators, ocean ECVs and climate models by including the representation of important feedbacks (permafrost, ocean-ice sheet coupling, wind and wave-ice coupling);
- Combine analyses of models and observations to further our understanding and science of the sea surface temperature and ocean heat content change and variability on different timescales and improve projections at regional scales;

- Actions will advance in closing the sea-level budgets on regional and local scales, with particular attention to sampling and surveying coastal areas.
- B. Improving the understanding, measurement, climate projections and predictions of key biogeochemical oceanic climate processes (inorganic carbon, oxygen, nutrients, transient tracers, nitrous oxide, ocean colour, particulate matter, dissolved organic carbon, stable carbon isotopes).

The project is expected to:

- Further develop the key biogeochemical ocean monitoring indicators and ocean ECVs;
 - Actions should combine GHG measurements in regions especially critical for GHG fluxes (the polar oceans, coastal and marginal seas, and coastal upwelling zones) with relevant biogeochemical measurements (e.g., oxygen, nutrients) to support GHG data analyses and model simulations;
 - Actions will further the research needed to better inform models and improve predictions of the Earth system response to ocean acidification; links should be made with ocean stratification;
 - Improve observations for the interplay between carbonate chemistry and a variety of biogeochemical and physical processes, including eutrophication and freshwater inflow in coastal zones;
 - Actions will 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 and deoxygenation in the ocean interior;
 - Actions will research the net response of natural ocean CH₄ and N₂O sources, including permafrost, to future warming and predict the magnitude and timing of the responses of each individual process.
- C. Improving the understanding, measurement, climate projections and predictions of key biological and ecosystem oceanic climate processes (marine habitat properties, plankton)

The project is expected to:

- Further develop the key biological and ecosystem ocean monitoring indicators and biological/ecosystem related ocean ECVs;
- Actions will further develop the link between climate models and ecosystem/marine habitat models to support ECV development; Actions will further develop observation processing for biological and ecosystem ECVs and assess needs for additional observations in support of biological ECV development and validation;

- Actions will support the development of common approaches and standards for the development of biology and ecosystem ECVs for the oceans by strengthening the use of observation networks and relevant biogeochemistry, biological and ecological measurements, the development of inter-calibrated protocols, notably for macroalgae, mangroves, and seagrass;
- Actions should include projected impacts of overshoot on ecosystems.

This topic is part of a coordination initiative between ESA and the EC on Earth System Science (flagships ocean health, polar and biodiversity). Under the EC-ESA Earth System Science Initiative both institutions aims at coordinating efforts to support complementary collaborative projects, funded on the EC side through Horizon Europe and on the ESA side through the ESA FutureEO programme.

HORIZON-CL6-2024-CLIMATE: Ocean models for seasonal to decadal and local to regional climate predictions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected outcome:

Contribution to the European Green Deal objectives in addressing resilience to climate change (mitigation and adaptation) in coastal areas to support both the sustainability of the blue economy and the protection of ocean health and coastal landscapes. Support to the Twin Transitions, Destination Earth and the development of Digital Twins.

Improvement of information ocean services, their uptake at local and regional scale provided by European programmes like Copernicus and anticipate the development of a scientific reporting and indicators on ocean climate and health

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

- Development of models (physics and biogeochemistry) for seasonal to decadal and long-term (21st century) ocean climate projections at basin scale;
- Configuration of these models from regional to coastal scale for climate change impact assessment;
- Regional to local ocean climate services to support policy implementation at local scale and the development of climate--neutral blue economy (e.g., ocean climate risk services);
- Demonstration of the impact of ocean climate change on marine ecosystems at regional and coastal scales;

Scope:

To close the gap between current Copernicus climate projections and existing Copernicus Marine physics and biogeochemical models used for daily ocean forecasting, proposals are expected to focus on:

- Developing capabilities for producing decadal to long-term (multi-decadal to centennial) refined regional projections of the ocean state downscaled from global climate models, to the European regional seas and coastal zones;
- Developing capabilities for producing decadal to long-term regional projections of biogeochemistry models to support ingestion into global/regional marine ecosystem models;
- Improving the representation of ocean processes (and dynamics, especially at regional to coastal scale) in climate models;
- Validating the approach by performing retrospective projections (historical runs) and comparing corresponding model results to observations and / or reanalysis over an instrumental multi-decadal period, with characterized uncertainties;
- Investigating and assessing the scientific value of ensemble projections (using the experimental framework) for ocean physical state (e.g., sea level) and for the first layers of the food web (from biogeochemistry to low trophic levels), over EU seas and their coastal zones, with characterized uncertainties.

Methodology and developments should be benchmarked with relevant use cases, to be experienced in three different EU regional seas and coastal areas involving both scientists and end users.

Proposals should foster the collaboration between the climate science community, the ocean science and operational oceanography communities (operating ocean services on a sustained way) and the Mission Restore our Ocean and Seas.

HORIZON-CL6-2023/2024-CLIMATE: Environmental and Earth Observation for improving joint climate (mitigation and adaptation) and biodiversity monitoring on land

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annexes [A and] B.
<i>Procedure</i>	The procedure is described in General Annex F. The following exceptions apply: [Where applicable,] Grants awarded under this topic will be coordinated with the Ministry of Science and Technology of the People’s Republic of China (MOST).
<i>Legal and financial</i>	The rules are described in General Annex G. The following exceptions apply: [Where applicable,] 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. Beneficiaries will be subject to the following additional obligation regarding open science practices: Open access to any new modules, models or tools developed from scratch or substantially improved with the use of EU funding under the action must be ensured through documentation, availability of model code and input data developed under the action.

Expected outcome: A successful proposal will contribute, by using or acquiring environmental data, particularly geographically explicit data such as Earth Observation data, to improve agriculture and land monitoring with a view to contributing 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. A successful proposal will furthermore contribute to advanced understanding and science on the mitigation, adaptation and biodiversity potential of land by bringing out solutions of monitoring, assessment and projections to support decision-making in climate and biodiversity policies on land and agriculture.

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

- Improved land monitoring with the use of Earth Observation data and information;
- Better monitoring of greenhouse gas emissions and removals of land under biodiversity protection and restoration;
- Better assessment of the impact of climate change on biodiversity and land condition;
- Identification of climate and biodiversity synergies and trade-offs on land and agriculture;
- Development of best practices in biodiversity and climate change monitoring to be used in the EU and China.

Scope:

The projects should:

- Strengthen 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 (UNCBD).
- Better report the synergies and trade-offs between mitigation, adaptation and biodiversity on land and agriculture.
- Design datasets and methodologies to set up a geographically-explicit monitoring of climate and biodiversity aspects on high carbon stock land, land with high climate risks, and land under biodiversity commitment (protection and restoration).
- Assess the potential of land to contribute to climate mitigation, including carbon sequestration; climate adaptation, including resilience and disaster risk prevention; and biodiversity, including protection and restoration.
- Strengthen cooperation between the EU and China, also in the context of a better cooperation between EuroGEO and AOGEO (Asia-Oceania GEO), building on the nationwide climate and biodiversity monitoring programmes in China associated to agriculture and land activities as well as the European Green Deal objectives.
- Interaction with other actions developed under the EU-China Climate Change and Biodiversity Research Flagship CCB Flagship and/or the Flagship on Food, Agriculture and Biotechnologies is encouraged.
- International cooperation is encouraged, in particular the People's Republic of China, but also with other countries.

DRAFT

Destination – Resilient, inclusive, healthy and green rural, coastal and urban communities

Places and people matter to the achievement 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 and digital strategy alongside the recent pandemic, bring challenges and opportunities that differ for different places and people. Rural (including mountains and sparsely populated areas) and coastal areas, play a key role in managing, protecting and using natural resources. The provision of both private and public goods from these areas depends on the resilience and attractiveness of rural and coastal communities and the capacity of people who live and work there to access a sufficient level of well-being. The COVID-19 pandemic has highlighted deficiencies in digital infrastructures and economic opportunities that hamper resilience. Innovation is a key enabler of the long-term vision for EU's rural areas that aims to overcome these challenges 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 initiative offers possibilities to redesign living spaces to improve sustainability, circularity and inclusiveness. In all communities, social, cultural and behavioural drivers play an important role in enabling or slowing down transitions. Knowledge and innovative solutions need to be developed to enhance 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), and attention to gender aspects, will foster a sustainable, balanced and inclusive development of rural, coastal and urban areas in three different ways. Firstly, it will aim to increase our understanding of the differential impacts of climate, environmental, socio-economic and demographic changes on rural, coastal and urban areas in order to identify ways to turn these changes into equal opportunities for people wherever they live, enhancing territorial cohesion and enabling 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 required to make informed choices and be actively engaged in the sustainable and circular management of natural resources, from production or service provision to consumption, in the spirit of the EU competence framework for sustainability. Rural, coastal and urban communities, in particular women, youth and elderly, the most vulnerable groups like indigenous people and those hit the hardest by the COVID-19 pandemic, need to see their labour conditions, quality of life and long-term socio-economic prospects improved in the context of major transitions and rising threats to climate, resources and health. Their capacity to drive community-led innovations must be enhanced and their resilience increased across the

diversity of European territories including remote places such as mountains and sparsely populated areas, including the Arctic. Mobilising the forces of digital transformation, upgraded innovation ecosystems, cultural heritage, nature-based solutions, more sustainable 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 and biodiversity strategies), especially its just transition component.
- Make a key contribution to the **flagship initiative “R&I for rural communities”** and to the four areas of work of the **long-term vision for EU’s rural areas**: stronger, connected, resilient, prosperous; it will in particular contribute to climate targets by putting the focus on climate-neutrality of rural communities that have specific needs and are often neglected by climate action.
- Complement the **New European Bauhaus initiative** that connects the European Green Deal to our living spaces; it calls on all Europeans to imagine and build together a sustainable and inclusive future that is beautiful for our eyes, minds, and souls.
- Make a key contribution to improve **social inclusion** in ecosystem based integrated coastal zone management and/or marine spatial planning.
- Contribute to the implementation of the **new joint communication on the Arctic** (adopted on 13 October 2021), to the fourth Arctic Science Ministerial Joint Statement⁶¹ and to the All- Atlantic Ocean Research Alliance.
- Contribute to the implementation of the **competence framework for sustainability**, under preparation by EAC and JRC⁶² and the upcoming Council Recommendation on education for environmental sustainability for learners of all ages and at all levels of education (part of the EU biodiversity strategy).
- Support the implementation of **EU Agenda for Tourism** (expected in early 2022).
- Contribute and link to the **just green and digital transition** called for by the 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:

⁶¹ 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.

⁶² <https://ec.europa.eu/jrc/en/greencomp>

- Improve understanding of policy makers and citizens regarding **social inclusion challenges**, the situation of **people in vulnerable situations in rural and coastal areas** and how to enhance **social resilience**, including in connection with ecosystem services for coastal areas.
- Improve understanding of policy makers of the **behavioural and structural drivers of people's lifestyle choices and people's perceptions of rural life** in the aftermath of COVID and of the long-term trends and opportunities for rural areas.
- Facilitate a **sustainable post-COVID recovery of urban, rural and coastal communities** through biodiversity-friendly actions, professional, collective and personal attitudes.
- Improve **connections, strategies and governance arrangements that foster 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.
- Make **rural and coastal actors feel engaged in a just and green transition** and equip them with strategies and innovations to contribute to the EU's climate-neutrality by 2050 and benefit from a climate-neutral economy.
- Increase prosperity thanks to the deployment of business models that are fit for the future and foster greater job opportunities for rural and coastal people, in particular with regards to territorial and marine economies and critical resources (water, soil, biodiversity)
- Upgrade and develop more **innovative and integrated policy frameworks** capitalising on international knowledge exchange, including indigenous, traditional and local knowledge⁶³ and cultural heritage in a bottom-up approach
- Enhance knowledge on the costs and benefits of **urban farming** and improved policy frameworks to maximise its benefits for European society at large across all dimensions of sustainability.
- Develop more **diverse and systemic approaches and innovative solutions** (digital, nature-based, social and community-led) **with and for local communities**, and increase the number of local actors with improved capacity to sustain these innovative processes and take up these solutions.
- Improve connections between food provision and multi-functional nature-based solutions for the benefit and well-being of citizens including increasing resilience (climate adaptation mechanisms) through the combination of the vision of the **New European Bauhaus initiative** to "*call on all Europeans to imagine and build together*"

⁶³ Reference for using this expression is UNESCO work: <https://en.unesco.org/links>.

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.

- Increase **understanding, support and engagement** among young people, professionals, authorities, decision makers and citizens at large **for all dimensions of sustainability** including through formal and informal education
- Local, coastal and policy communities use the **coastal and nature-based ecosystem services for potentially year-round diversified sustainable eco-tourism activities.**
- Develop measures of **well-being of the community** beyond economic indicators (including social, environmental) and use them for developing **collaborative community management models**, including for sustainable **tourism.**

Expected impact

Proposals for topics under this destination should set out a credible pathway contributing to **resilient, inclusive, just, healthy and green rural, coastal and urban communities** and more specifically one or several of the following expected impacts:

- Develop **rural, coastal and urban areas in a sustainable, balanced and inclusive manner** thanks to a better understanding of the environmental, socio-economic, behavioural, cultural, architectural and demographic drivers of change and their interconnections, as well as deployment of digital, nature-based, social and community-led innovations.
- Empower **rural, coastal and urban communities to act for change**, better prepared to achieve climate-neutrality, adapt to climate change, restore biodiversity and ecosystem services and turn digital and green transitions into increased resilience to various types of shocks, good health and positive long-term prospects, including jobs, for all including women, young people and people in vulnerable situations.
- Equip rural communities with **upgraded innovation ecosystems and innovative and smarter circular solutions that increase access to services and job opportunities**, including for **women, youth and the most** people in vulnerable situations, improve attractiveness and reduce the feeling of being left behind, even in the most remote locations like mountains and outermost regions.
- Boost **sustainable development of coastal areas**, including coastal protection and resilience, reaping the benefits of social, digital and community-led innovations, to deliver nature-based and scientifically validated solutions to existing coastal socio-economic and environmental threats. In this way, enable applications of new social, economic and governance frameworks.

- **Urban and peri-urban communities** – including the most vulnerable individuals and families – can access, afford and choose healthy, nutritious and environmental-friendly food.
- Facilitate **communities in natural and coastal areas** to offer sustainable, quality, environmentally and socially friendly **tourism, recreational and leisure activities**.

Proposals are invited against the following topic(s):

**HORIZON-CL6-2023-COMMUNITIES: Enhancing social inclusion in rural areas:
Focus on vulnerable groups and social economy**

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation 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 use the multi-actor approach. See definition of the multi-actor approach in the introduction to this work programme part.

Expected outcome: The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the European Green Deal, in particular its fair and just transition component, the European pillar of social rights, EU social economy action plan, initiative on essential services and the EU long-term vision for rural areas.

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

- Improved understanding of policy makers and citizens regarding social inclusion challenges, the situation of vulnerable groups in rural areas and how to enhance social resilience.
- Improved policies and governance frameworks for social inclusion and social economy.
- Increased development of social entrepreneurship.

Scope:

Proposals are expected to:

- Analyse situation of **vulnerable groups** in various rural areas of Europe, address demographic challenges including ageing and vulnerability of young people where relevant (in particular NEET). [*Pay attention to complementarity with C2 Spatial mobility topic*]
- Benchmark policies, social services and initiatives developed at various levels to empower vulnerable groups to improve their situation, including social/care farming, social economy and entrepreneurship. Assess the quality, strengths and weaknesses of these services and to which extent they are used/reached by the target groups.
- Explore the role, potential and limitations of social economy and social enterprises (inc. social and care farms) in supporting vulnerable groups in rural areas, including for the provision of services and new ways to reach target groups (where is it essential for public policies to come in with support and/or enabling framework)
- Make policy recommendations on how to improve service delivery and meeting the needs of vulnerable groups.
- Accompany pilot innovation actions supporting vulnerable groups to draw additional knowledge from concrete examples.

HORIZON-CL6-2023-COMMUNITIES: Improving rural futures 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 XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<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>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:

The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU long-term vision for rural areas, the European Green Deal, democracy and demography, territorial agenda 2030 and the New European Bauhaus initiative.

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, coastal and urban areas and more integrated territorial policies and strategies in a growing number of localities.

Improved business opportunities thanks to more proximate, circular and green economy

- Improved mutual access of rural and urban actors to services provided by either types of areas
- Improved social connectivity, social capital, resilience and capacity to face changes

Scope:

- Proposals should build on results of RURBAN, ROBUST (e.g. rural-urban learning hub), COASTAL and RURITAGE [+projects RURALURE (rural museums) + Sustainable tourism projects] and seek to improve the uptake/update of the governance models they have identified as promising.
- Support concrete projects for developing rural-urban or other (e.g. land-sea/rural/coastal) **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.
- Attention should be paid to the ecological and digital transitions, the potential of digital technologies as well as social inclusiveness and access of rural communities to opportunities.
- Financial support to third parties as an option either to select pilots for developing partnerships or innovative solutions to be developed to support delivery of concrete synergies.
- Proposals should experiment in priority 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), **greener economy/society** (ecosystem services, inc. NBS), **circularity** (closing loops/ flows), **services** (improving social connectivity, new ways of working and living), **culture and heritage** (building territorial identities).
- Potential link to **New European Bauhaus** so that NEB works not only in urban but also in rural, ideas flowing from one to the other, looking into how NEB can favour rural residence of public officers [Cooperation with topics on NEB and urban food].

- Capitalisation on lessons learnt to further upgrade and future-proof policy frameworks and enabling environments.

HORIZON-CL6-2023-COMMUNITIES: 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 XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Action

Expected outcome: The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU long-term vision for rural areas and the territorial agenda 2030.

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

- Upgraded and more innovative and integrated policy frameworks capitalising on international knowledge exchange.
- Enhanced uptake of positive narrative on the future of rural areas at international level.

Scope:

Proposals are expected to:

- Perform international benchmarking of rural policies within the EU and third countries who appear as best practice (OECD + Africa) with science-society-policy exchange activities, global dialogue on rural policies + capacity building for policy-makers
- Analyse delivery mechanisms (decentralised vs centralised, quality of multi-level governance, role of politics) and ways to measure impact (inspiration for the rural observatory).
- Focus on multi-dimensional policies that address all problems in an integrated manner.

HORIZON-CL6-2024-COMMUNITIES: 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 XX 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 XX million.
<i>Type of Action</i>	Innovation Action
<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>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 Joint Research Centre (JRC) may participate as member of the consortium selected for funding</p>

Expected outcome:

The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU long-term vision for rural areas, the European Green Deal, in particular the climate pact, Fit for 55, the territorial agenda 2030 (Green Europe) and the OECD Rural action plan following COP26.

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

- Rural communities are engaged in 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 meeting climate-neutrality objectives, such as dashboards, data visualisation techniques, modelling, digital twins of entire rural communities or tools contributing to spatial planning.
- Policy makers are better informed about policy and regulatory frameworks that are likely to encourage climate-neutrality of rural areas while avoiding undue negative impacts [see in result of 5th meeting elements on LULUCF, consider mobility, housing, energy alongside agriculture].

Scope:

- Building on the results of the projects funded under (1) *grasping rural diversity*, in particular its framework and indicators on climate-neutrality of rural communities.
- Design, prototype and test concrete innovations (technical, social, organisational) supporting climate-neutrality, zero pollution and biodiversity enhancement in rural communities, possibly including things such as nature-based solutions, circularity, bio-based solutions, community-energy systems, climate-neutral mobility, fire-prevention etc.
- Innovations should be tested for their feasibility and acceptability by rural stakeholders and for the territorial development opportunities or drawbacks that they bring.
- Scope taking into account agriculture and LULUCF by 2035 but focusing mainly on areas of community life where there are specific challenges and opportunities for rural communities (*See specific actions for agriculture and forestry under destination 5 + roadmap climate*). Spatial planning, especially.
- Include training and capacity building on these specific themes.
- Knowledge sharing between communities + capitalisation on lessons learnt for policy.
- Collaboration with climate-neutral cities on solutions found that could also be interesting for rural communities.

[To be adjusted to the programming of Cluster 5, as Cluster 5 should be addressing the specific needs of rural areas too].

HORIZON-CL6-2024-COMMUNITIES: Societal perceptions and benefits of rural life and jobs: will COVID generate a long-lasting shift?

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

Expected outcome: The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU long-term vision for rural areas and the territorial agenda 2030.

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

- Improved understanding of policy makers of the behavioural drivers of people's lifestyle choices and people's perceptions of rural life in the aftermath of COVID and of the long-term trends and opportunities for rural areas.

Scope:

- Behavioural/ social psychology/social science/history/cultural/economic studies on societal perception of rural areas and lifestyles, including societal perception of farming in a variety of places across Europe
- Understanding the drivers of attractiveness (farming and rural) or criticism and biases between perceptions and facts, both from rural people and urban people (inc. perception of various farming sectors and practices).
- Analyse how these drivers have been affected by COVID and are likely to evolve, on the short to long-term (2050) (e.g. economic and trade evolution, new ways of working, multi-local living, zero pollution, health risks etc.).
- Analyse initiatives aiming at shifting perceptions and pilot new ones in localities with science support.
- Use foresight (e.g. scenarios; build on trends analysis and disruptive factors, weak signals) to develop adequate strategies to mitigate threats and seize opportunities.

HORIZON-CL6-2024-COMMUNITIES: Scaling-up the adoption of business models fit for the future

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Innovation Action

Expected outcome: The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU long-term vision for rural areas and the European Green Deal, the Farm to Fork, Forest and Bioeconomy Strategies.

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

- Increased prosperity thanks to the deployment of business models that are fit for the future and foster greater job opportunities for rural and coastal people, in particular with regards to territorial and marine economies, including circular and bio-based economies.

Scope:

- Building on work of RUBIZMO and LIVERUR.
- Piloting business models that take advantage of opportunities offered by megatrends to foster wealth and well-being of rural communities while taking advantage of the ecological and digital transitions through open call for specific demonstrators.
- Explore links with territorial food systems, cross-sectoral and cross-territory linkages.
- Explore concepts like those in the OECD “rural manufacturing project” that builds on regional economic analysis. Field most explored by JRC and REGIO so far. Potential interest to the Rural observatory.
- Capitalisation on how policies can support these types of business models.
- Consider and exploit the digital dimension and opportunities of future business models.
- Explore potential of social economy and cooperatives/new types of collective approaches not only for vulnerable populations but also as a way to support local economy.

HORIZON-CL6-2023-COMMUNITIES: Assessing urban farming impacts and related risks

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.

<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility condition</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

The successful proposals will support the European Green Deal, Farm to Fork Strategy and impact assessment for the post-2027 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:
 - 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;
 - 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;
 - 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, regulation of the urban heat island effect etc.), in relation with Green deal objectives;
 - The provision of social benefits (e.g. access of new and/or young farmers) and improvement of social capital (e.g. values, networks, governance) and community cohesion in urban and rural areas.
 - 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.

HORIZON-CL6-2023-COMMUNITIES: Unlock 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 XX 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 XX 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:

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 biodiversity strategy, 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 overall aim of this topic and associated R&I activities is to leverage the New European Bauhaus values for urban food system transformation in order to enable sustainable, inclusive and aesthetic ways of food system transformation.

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

- Combine 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” with food systems to enhance sustainable food system transformation;
- Use food to reconnect and engage citizens with nature for their well-being and health while providing multifunctional benefits, such as biological diversity

Scope:

Proposals are expected to address the following:

- Involving all three core values of NEB: 1) sustainability; 2) aesthetics/quality of experience 3) inclusion and using architecture for innovative solutions for current and future needs linked to sustainable food environment and connecting citizens closer to sustainable food environments and connecting food provision to multi-functional nature-based solutions (e.g. urban gardens connected to parks, edible trees and bushes, edible green infrastructure etc.)
- Connecting food to local cultural values by using local plants and herbs, also supporting local ecological resilience
- Using place-based solutions with strong citizen engagement (especially youth) with a plan to multiply across Europe and taking into account different types of urban areas and connecting rural and urban areas for co-benefits and enhanced inclusive experience, by also using data and technology⁶⁴
- Creating win-win strategies between public stakeholders and citizens by engaging citizens actively in provision of public services related to food (including schools, public areas...etc.)
- Set out a clear plan on how to collaborate with other projects selected under this and any other relevant topic/call, as well as other initiatives under NEB such as the EIT Cross-KIC NEP initiative e.g. by participating in joint activities, workshops, as well as common communication and dissemination activities and connect with learnings from other initiatives, such as “Year of Greener Cities”, “Year of youth”.

HORIZON-CL6-2023-COMMUNITIES: Inclusive and smart ways to communicate sustainability of food

Specific conditions

⁶⁴ The project is encourage to explore synergies with topic 5.1.4 in European Digital Programme 2021-2022 “Digital solutions in support of the New European Bauhaus initiative”.

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:</p> <p>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 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 environmentally friendly food system, as well as of the EU's Climate ambition for 2030 and 2050. This will contribute to transforming food systems so that they can deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of 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 of the following expected outcomes:

- Understand 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
- Identify best means of transmission and presentations of sustainability related information to guide and change consumer behaviour

Scope:

Proposals are expected to address the following:

- Analyzing the impact of marketing/media on the consumer understanding of sustainability and the consumer response to sustainability information including issues of trust and reliability

- Analyzing the status of consumer information expectations/needs (conscious and unconscious) related to sustainability and understanding how sustainability related information expectations/needs can be increased/developed as well as their drivers and challenges
- Testing 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), possibly by using social innovation
- Testing the response of information related to at least two dimensions of sustainability, including aspects that cover the whole food chain, such as biodiversity, packaging or composting

HORIZON-CL6-2024-COMMUNITIES: Demonstrating the potential of Nature-based Solutions and the New European Bauhaus to contribute to sustainable, inclusive and resilient communities

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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:

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 Biodiversity Strategy for 2030, the successful proposals will support the development of solutions contributing to the sustainable, balanced and inclusive development of urban, peri-urban and rural areas and to the empowerment and resilience of their communities.

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

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

- A new societal vision for sustainable, resilient, healthy, inclusive and thriving communities, based on the combination of the NEB with NBS;
- Greater understanding of the links between NBS and the NEB and how to better make these two approaches compatible and integrated in places, industrial systems, policies and communities;
- Greater use of NBS, as well as awareness and engagement of citizens with nature;
- Demonstration of a sustainable recovery of society and the necessary transformative change through biodiversity-friendly actions, professional, collective and personal attitudes.

Scope:

NBS can be an integral part of our living spaces that contribute to our well-being, promote togetherness and connect to our 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 air quality, water management, green job creation, tourism opportunities, urban regeneration, health and well-being.

It is therefore important to analyse the potential of NBS in view of the NEB initiative and conceptualize, test and demonstrate how to link these two approaches, avoid trade-offs and enhance synergies and complementarities, through local demonstration.

Proposals are expected to address the following:

- Demonstrate local NBS ensuring coherence with the three core values of the NEB: 1) sustainability; 2) aesthetics/quality of experience; and 3) inclusion;
- Considering the existing NBS portfolio (Horizon 2020 and Horizon Europe), further demonstrate NBS, notably addressing the new elements brought by the NEB (e.g. aesthetics, quality of experience) and in new configurations, such as in transport infrastructure, educational and cultural buildings, or urban spaces;
- Explore the connections and possible trade-offs (and propose ways to overcome them) between biodiversity targets in NBS and the NEB.
- Building on the existing NBS portfolio (Horizon 2020 and Horizon Europe), and in light of the new elements brought by the NEB, propose innovative tools for the

implementation, maintenance and monitoring of NBS, as well as the necessary business and governance models for their implementation and upscaling;

- Building on the approach of the NEB, develop place-based NBS with strong citizen engagement (e.g. youth, elder, minorities) and social innovation, and the necessary tools for citizen participation and the co-creation of solutions.
- Engage, through sustainable transdisciplinary collaborations, communities of practice that very rarely work together (e.g. architects, landscape architects, designers, ecologists, psychologists, economists, anthropologists), bridging epistemological gaps, while also contributing to the breaking up of silos in local/regional administrations.
- Propose 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.
- Explore the role of NBS and NEB in transformative change to provide holistic solutions to address global challenges (climate, biodiversity, economic, demographic, etc), including through transformative and contemporary arts.

HORIZON-CL6-2024-COMMUNITIES: Traditional knowledge, indigenous peoples, and co-creation of knowledge for social and environmental innovation in the Arctic/Atlantic

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome:

The proposal will contribute to sustainable and inclusive coastal development, supporting the implementation of the European Green Deal, incorporating a better understanding of the environmental, socio-economic, cultural and demographic drivers of change, in the Arctic and Atlantic areas.

The successful proposal will specifically contribute to:

- Increased awareness of traditional environmental knowledge and indigenous/ local communities involvement in environmental and marine protection governance and decision making;
- Empowering Arctic people to act for change through education and upgraded skills, leading to positive long-term prospects;
- Develop an educational curriculum of mixed methods that allows researchers and other knowledge-holders to work together.

Scope:

The proposal will contribute to sustainable and inclusive coastal development, incorporating a better understanding of the environmental, socio-economic, cultural and demographic drivers of change, in the Arctic and Atlantic areas.

It will investigate the involvement of indigenous and local communities in the governance of their livelihoods and environment. It will examine to what extent Arctic communities' ways of knowing, traditional knowledge about the Arctic environment and other types of indigenous knowledge, are considered and contribute to protect the Arctic environment and Oceans.

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 which respect long-term environmental carrying capacity, and social goals.

Proposals should identify opportunities for partnerships and co-production of knowledge based on indigenous and scientific ways of knowing and will explore in participatory ways what models could work.

Destination – Innovative governance, environmental observations and digital solutions in support of the Green Deal

Taking advantage of the use, uptake, deployment and exploitation of environmental observations as well as digital and data-based green solutions, assessed through the ‘do not harm’ principle of the Green Deal, is key for innovative governance models and a science-based policy design, implementation and monitoring. 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 by the key stakeholders and end users. In particular, the Agricultural Knowledge and Innovation Systems (AKIS) needs to be reinforced to accelerate the required transformative changes.

Innovating with governance models and supporting policies

Transformative changes such as those required within the 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 coming from different sources.

R&I activities under this destination aim at both: experimenting with new ways to govern the transition process and strengthening the governance, in particular by ensuring appropriate and inclusive stakeholder engagement, including civil society and regional and local actors, environmental observations coverage, and making information and knowledge available and accessible. R&I for governance to support the Green Deal shall provide insights into opportunities to overcome potential institutional barriers such as lock-ins, path dependency, political and cultural inertia, power imbalances and ways to strengthen the effectiveness and efficiency of regulatory pathways, and facilitating synergies and linkages between different policy instruments and funding opportunities.

Innovative governance supporting the 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 globally, whether these be climatic, ecological, economic, social, geopolitical or related to agricultural inputs and resources, food, health, the bio-based sectors or the wider bioeconomy. Critical risk assessment and reduction strategies need to be incorporated, including the diversification of infrastructures, resources and knowledge through more self-sufficiency and autonomy.

Environmental observations/GEOSS

Data and information obtained through environmental observation is of great value when assessing the state of the planet and is delivering crucial information to support the Green Deal and the climate and ecological transitions. Integration of 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,

delivers information necessary for shaping the direction of the development of policies in the broad context of Cluster 6 of Horizon Europe. A strong link to Copernicus, the European Earth observations 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*⁶⁵, 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 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 Cluster 4 and Digital Europe Programmes activities, 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, positive and negative, need to be better understood and monitored in view of future policy design and implementation, governance, and solution development. The potential of digital and data technologies to increase the sustainability and resilience of production and consumption systems, incl. industry and services, in sectors covered by this Cluster is to be exploited. This destination will contribute to the development and support the 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 of the systems. More specifically, R&I activities will add value to existing knowledge and foster cost-effectiveness, safety and trustworthiness of innovative environmentally-friendly technologies in and across primary production sectors, food systems, bio-based sectors, bioeconomy, ocean and biodiversity. It will also give attention to precision and collaborative technologies and contribute to the human-centric twin green and digital transitions, which is a key policy objective also supported by the cross-cutting objective pursued by the Common Agricultural Policy (CAP), the 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)⁶⁶

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 cross-cutting objective of the CAP, 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

⁶⁵ <https://digital-strategy.ec.europa.eu/en/policies/destination-earth>

⁶⁶ 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)

consumer. AKIS is a key driver to enhance co-creation and thus speed up innovation and the take-up of results needed to achieve the 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 in particular the CAP, reinforcing the multi-actor approach and setting up structural networking within national/regional/local AKISs. In addition, social innovation also holds potential to achieve the objectives set in this destination, as it enhances the resilience of communities, increases the relevance, acceptance and uptake of innovation, and helps foster lasting changes in social practices, therefore acting as a system changer.

The following outcomes are expected:

- The partnership 'Agriculture of Data' will contribute to increased sustainability performance of agricultural production and strengthened 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 the capitalisation and use of data.
- Produce knowledge and innovative 'green' solutions (including to fill in-situ gaps) to support evidence-based policymaking, implementation and monitoring, including the development of EU policies and programmes under the Multi-annual Financial Framework (MFF) beyond 2021-2027.
- Strengthen monitoring, reporting and management of natural resources and evaluation capacities, improving geographical coverage and data collection through innovative digital and data-based 'green' solutions (when relevant, through the use of local digital twins), including with science break-through and participatory, social and place-based innovation and governance.
- Strengthen EU and international science-policy interfaces for improved governance in many areas, for example biodiversity protection, climate change, agriculture, forestry, bioeconomy, and blue economy and food systems.
- Address political and socio-economic lock-ins, including mainstream and social media, and ensure policy coherence, the provision of sustainable public goods and services, and deliberative engagement regarding science and innovative solutions.
- Foster the role of remote and in situ sensing and digital technologies (including AI) to enhance monitoring, reporting and verification of emissions and their removal for the EU's land use (LULUCF) and carbon farming policies.
- Deliver climate services for the climate transition using the broad range of environmental observations under the EuroGEO initiative.
- Make good use of the wealth of environmental data acquired by citizens to support policy development.

- Increase the resilience, sustainability and performance of production systems and working conditions in the sectors fostered through social transformation (with particular focus on e.g. gender, youth) and innovative solutions also based on digital and data technologies, including AI-, IoT-, and augmented reality-based solutions.
- Foster the inclusive usage of digital and data technologies to improve economic circularity, reducing waste and promoting reuse of materials.
- Foster inclusive usage of beneficial trustworthy digital technologies, including an inclusive investment environment to drive sustainability and green deal targets.
- Support effective AKIS by deepening the functioning of innovation support and bridging the gap between sciences and practice as well as the divide among thematic and advisory networks.
- Support governance and social innovation in the bioeconomy and bio-based systems (such as revitalisation of European local communities with innovative bio-based business models and social innovation, or co-creation and trust-building measures for biotechnology and bio-based innovation systems), transforming traditional fossil fuel-based economic regions towards circular bioeconomy model regions.
- Inclusive usage of beneficial digital technologies including media and creation of networks with citizens (citizen engagement) and researchers to enhance food system transformation and resilience.

Expected impact

Proposals for topics under this destination should set out a credible pathway contributing to innovative governance and sound decision making in policy 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;
- Green Deal related domains benefit from further deployment and exploitation of Environmental Observation data, products and 'green' solutions;
- A strengthened Global Earth Observation System of Systems (GEOSS)⁶⁷;
- Sustainability performance and competitiveness in the domains covered by Cluster 6 are enhanced through further deployment of digital and data technologies as key enablers;

⁶⁷ 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).

- Better informed and engaged stakeholders and end users including primary producers and consumers thanks to effective platforms such as Agriculture Knowledge and Innovation Systems (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” principle⁶⁸ according to which the research and innovation activities of the project should not be supporting or carrying out activities that make a significant harm to any of the six environmental objectives of the EU Taxonomy Regulation.

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”; and “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) actions so that ESA space data and science can be integrated in a proactive manner in the research actions of the WP identified as relevant.

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

Heading 1 – Innovating with governance models and supporting policies

Proposals are invited against the following topic(s):

HORIZON-CL6-2023-GOVERNANCE: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Programme Co-fund Action

⁶⁸ as per Article 17 of Regulation (EU) No 2020/852 on the establishment of a framework to facilitate sustainable investment (EU Taxonomy Regulation)

<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B. 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. 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.</p> <p>The following additional eligibility criteria apply: Proposals focusing on one type of activity or sector are out of scope.</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>
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Expected outcome: In line with the objectives of the European Green Deal and Digital Europe priorities, the successful proposal will contribute to the sustainability and resilience of the blue economy by supporting the establishment of innovative governance models. It will also contribute to strengthening the EU and international science-policy interfaces in marine- and maritime-related domains as well as the Global Earth Observation System of Systems (GEOSS) by supporting the further deployment and exploitation of Environmental Observation data and products and of digital and data technologies.

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

- EU and national multi-level cooperation and alignment across and within regional seas of research and innovation programmes, priorities and investments are enhanced, based on established strategic research and innovation agendas and related cooperation activities, including international agreements and outreach; as well as cooperation with other Horizon Europe initiatives, European partnerships and missions.
- Europe's role in ocean science, research, social and technological developments, innovation and productivity in the marine domain is clearly strengthened by 2030 and transformative governance enables the advances of the role of Europe in business, finance and social developments in the marine/maritime domain.
- By 2030, Europe has contributed significantly and in a measurable way to the climate-neutrality of the blue economy, the European Green Deal objectives and its different strategies.
- The science-based implementation of EU marine-related legislation, regulations and objectives is supported, as well as the advanced sustainability of activities, practices and existing and new products and services of the blue economy value chains throughout European regional seas and the Atlantic.

- Transformative change is promoted and enabled through actionable science and sustainable, fair and just solutions for the blue economy and for communities, involving a participatory and multi-stakeholder approach.
- The deployment of digital, nature-based and social innovations as well as community-led and purpose-driven technology for the blue economy is supported.
- Ocean literacy in the EU and beyond is increased.
- Sustained ocean and coastal observations and availability of FAIR data for environmental, climate and blue economy purposes are substantially increased.
- Global cooperation with key partners bordering the different EU sea basins is strengthened.

Scope:

Europe's seas and ocean do not stop at national borders, nor do the challenges they face. Many of the issues are common throughout European seas and the Atlantic, even globally. A major effort is needed to increase the development of ocean science, research, technological developments and innovation, both to protect the ocean and to increase the resilience of its ecosystems and to ensure a strong sustainable blue economy and science-based design of marine spatial planning, involving all stakeholders. No nation can face this on its own and undertake the investments in research, technology and innovation that are needed to steer new business, governance and social developments[1].

Many of the identified research priorities and activities of the EU and individual countries are similar and, therefore, require alignment over all European seas and ocean. Existing and new funding streams from national, public and private sources will need to be pooled, together with EU funding, in order to maximise efforts and achieve efficiency gains. To address these issues, sea basin-specific Research and Innovation Agendas (RIAs) have been developed for the Atlantic, the Mediterranean, the Baltic Sea and the North Sea, and the Black Sea[2]. An impact-driven and coherent approach needs to be designed to combine all of these research and innovation agendas, in order to structure the European landscape, so that common issues can be addressed jointly, and national marine strategies are developed in a consistent way.

The partnership should catalyse the transformation of Europe's blue economy towards climate-neutral status by 2050. By aligning national, regional and EU R&I priorities and bringing together science, industry, governance and society, it should deliver knowledge and solutions to make the blue economy sustainable. Responding to national and EU policy goals (e.g., European Green Deal, Marine Strategy Framework Directive), the partnership should aim to achieve a healthy ocean, a sustainable and productive blue economy and the well-being of citizens.

The partnership should increase scientific contributions, applicable in a legal/regulatory context, related to biodiversity, ecosystem conservation and restoration, climate mitigation and adaptation, and pollution, including eutrophication, noise, marine litter and hazardous

substances, and should facilitate the use of scientific knowledge by regulators and policy-makers, contributing to the EU biodiversity strategy for 2030, the farm to fork strategy, the mission in the area “Ocean, seas and waters”, the circular economy action plan and the zero pollution ambition.

The partnership should promote technological, nature-based, social, economic and cultural innovation and experiment with new planning, governance, business and finance models. It should also contribute to the future EU initiative on ocean observation, to the development of a common European ocean data space, to the Ocean Digital Twin and to the implementation of the European Ocean Observing System (EOOS).

The partnership 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. It should engage local, regional and national authorities, industry and businesses, including SMEs, knowledge institutions and citizens 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, this topic should involve the effective contribution of SSH disciplines.

It should contribute to improve the 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 European Partnership for a climate-neutral, sustainable and productive blue economy should be implemented through a joint programme of activities for high impact, relevance and capacity building, ranging from research to coordination and networking activities, including training, demonstration, communication and dissemination activities in all research and innovation projects of the partnership. Emphasis should be given to demonstration, upscaling and experimentation calls. To ensure effective and smooth implementation, three dedicated pillars of activities within the partnership are needed:

- Implementation of joint activities in particular calls for proposals with co-funding from the Union;
- Implementation of joint activities without co-funding from the Union;
- A broad set of activities supporting coordination, international cooperation and outreach, uptake of results etc.

These activities should be structured along the following main building blocks of activities:

- Development of work programmes as implementation steps of the high-level Strategic Research and Innovation Agenda (SRIA). This SRIA should be included in the proposal, outlining implementation modalities and building on existing SRIAs or equivalent in the EU sea basins. It should include the demonstration of the achievability of policy targets at sea-basin scale;
- Joint calls for challenge-driven R&I to address critical issues for a sustainable climate-neutral blue economy with integrated and multi-stakeholder approaches;
- Setting-up a multi-stakeholder community of practice to facilitate science-policy-business-society dialogues, share experiences and disseminate results and innovations on key issues for social transition and sustainable development;
- Undertaking communication and dissemination measures to make R&I results accessible for all stakeholder groups and users and prepare guidelines, references, tools and trainings for replication and mainstreaming; communicating to citizens and civil society at large, and involving them to achieve policy goals;
- Synthesising R&I results and achievements from clusters of projects;
- Setting-up (a) knowledge hub(s) to support capacity-building on integrated approaches;
- Setting-up rigorous monitoring to follow progress of projects and taking stock of diverse solutions, good practice cases and the contribution to the achievement of the objectives of the partnership and the related policy targets;
- Exploring interfaces with public procurement and investment programmes by developing links with other programmes, private funds, etc. to support take-up and larger-scale implementation of tested approaches and solutions.

Given the global dimension of ocean policy, membership and other modalities of participation from organisations and institutions in non-associated third countries is strongly encouraged, in particular key partners bordering the different EU sea basins. International cooperation should contribute to align strategies and research agendas, strengthen data collection, monitoring and sharing, as well as access to 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. It should support the EU's strong commitment to the UN Decade of Ocean Science, the G7 Future of the Seas and Oceans Initiative, the All-Atlantic Ocean Research Alliance, the BLUEMED Initiative, the Black Sea Synergy and other international initiatives.

The partnership should cover the Atlantic, the Baltic Sea, the North Sea, the Mediterranean and the Black Sea. 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, will be established.

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, 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 synergies with other relevant proposed European Partnerships, notably “Rescuing biodiversity to safeguard life on Earth”, “Safe and Sustainable Food Systems”, “Water security for the planet (Water4All)”, “Zero-emission waterborne transport”, “Clean Energy Transition” and others where relevant, as well as the EIT Climate KIC and the EIT FOOD. The partnership will also be linked to the relevant objectives of the mission in the area of “Ocean, seas and waters”. Proposers are expected to describe in details the way to implement such collaborations.

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 primary activities of this action in order to be able to achieve its objectives. Therefore, the 60 000 EUR threshold provided for in Article 204 (a) of the Financial Regulation No 2018/1046 does not apply. It is expected that the partnership organises joint calls on an annual base and therefore it should consider ample time for the implementation of the co-funded projects. The EU contribution for this action will be implemented in annual instalments of around EUR XX million.

Engaging with managing authorities of European Structural and Investment Funds, as well as others like LIFE, 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.

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.

[1] The final evaluation of the BONUS programme, the mid-term review of the EU Atlantic Strategy, the OECD report on the Blue Economy, the IPCC report on the ocean and cryosphere, etc. support this.

[2] The Strategic Research and Innovation Agenda for the Black Sea is a milestone feature of the EU’ Black Sea Synergy policy and a scientific pillar of the Common Maritime Agenda for the Black Sea.

HORIZON-CL6-2023-GOVERNANCE: European Partnership of Agriculture of Data

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX million and an overall budget of EUR XX 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 XX million.
<i>Type of Action</i>	Programme Co-fund Action
<i>Eligibility conditions</i>	The conditions are described in 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. 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 XX EUR threshold provided for in Article 204 (a) of the Financial Regulation No 2018/1046 does not apply.
<i>Total indicative budget</i>	<i>The total indicative budget for the duration of the partnership is XX million for WP 2023-2024</i>

Expected Outcome: A successful proposal will contribute to the objectives of the Agriculture of Data partnership proposal. 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 some of the following outcomes:

- Improve agri-environmental monitoring tools and strengthen capacities to assess the status of agri-environmental and climatic conditions particularly by enhancing the integration of data sets provided by various platforms/networks.
- Boost the uptake of digital Earth, environmental observations and forecasts data-based solutions, and data technologies in agriculture, by providing tailored, easily accessible end-user-oriented data-based solutions.
- Promote the use of digital Earth, environmental observations as well as applications of digital and data technology to improve climate adaptation and resilience of agriculture

and to minimise the negative impact of agriculture on the climate, environment and biodiversity.

- Achieve synergies in the development and utilisation of data-based solutions for both the agricultural sector and policy monitoring and evaluation.
- Facilitate the use and reuse of Earth/environmental observations and other data to create tools and services that can be easily adopted by farmers, organisations and businesses and to achieve a wide and rapid outreach of the benefits of their use.
- Make available tools that may allow to accommodate different needs of actors in, environmental observations and other data, including data technologies, with farmers, agronomists, policy-makers and public administration, including paying agencies and companies developing farm machinery and software e.g. FMIS (Farm Management Information Systems).

The outcomes will be further defined in the coming weeks by the Core group for Agriculture of Data, consisting of country representatives.

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 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.

The scope will be further defined in the coming weeks by the Core group for Agriculture of Data, consisting of country representatives.

HORIZON-CL6-2023-GOVERNANCE: Advancing analytical (modelling) capacity and tools to support sustainable EU agri-food policies post 2030

Specific conditions	
<i>Expected contribution per project</i>	<i>EU</i> The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

HORIZON-CL6-2023-GOVERNANCE: Towards CAP post 2030: 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 EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action

HORIZON-CL6-2023-GOVERNANCE: Regional ecosystems of innovation to foster place-based quadruple helix food systems innovation for co-benefits

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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>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: Achieving the Farm to Fork strategy’s objective of a fair, sustainable and resilient European food system requires strong and well-connected food systems actors, in particular small & medium companies, researchers, farmers, fishers, consumers, and civil society organisations. Successful proposals will support the food system transformation and the implementation of sustainable solutions by boosting knowledge sharing, interactions and priority setting in the form of an acceleration agenda between all relevant food systems actors.

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 the European agri-food, fisheries and aquaculture sector in line with the Farm to Fork strategy.
- Improved coordination of European and national platforms with regional innovation ecosystems actors at EU level.

Scope: Proposals will create an effective framework for action, which is expected to allow pooling resources, coordinating efforts, and facilitating and promoting the multi-actor approach to support the food system transition in the EU and Associated Countries and to develop the relevant capacities to foster the necessary R&I in the short, medium, and long-term, including also the organic food sector.

Proposals should cover all of the following aspects:

- Strengthening ecosystems of innovation that exist to broaden and take on a “food systems approach” and become a truly quadruple helix model (that identifies four major actors in the innovation system: science, policy, industry, and society) delivering solutions that empower regional actors and their regional innovation ecosystems through an acceleration agenda.
- Drawing “lessons learnt” and devising an acceleration agenda connected with the Strategic Research and Innovation Agendas (SRIAs) that align to target mutual objectives and cross regional collaborations.
- Encouraging “mutual learning” and stimulating “new” ecosystems of innovation between the actors.
- Helping implement Farm to Fork relevant objectives actions (in particular for middle part of food system - like “code of conduct for responsible businesses”) and other key issues like responsible innovation (RRI).
- Take a systemic view to help the European food systems related industry, in particular SMEs, to gain a competitive advantage in global markets through mobilising and networking these actors at EU level.
- Contribute to the broad communication, dissemination and exploitation of Food 2030 and Farm to Fork-related EU project results, increasing societal awareness and uptake of sustainable practices by end users, thereby boosting these projects’ impact.

HORIZON-CL6-2024-GOVERNANCE: 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 XX 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 XX 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:</p> <p>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 European Green Deal priorities, the farm to fork strategy in particular the Contingency plan for ensuring food supply and food security, 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 an interdisciplinary and inclusive pan-European academic network for food system science.

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

- Improve access to excellence and advancement in the scientific understanding of food systems, in particular their systemic aspects, as to how they function, and how to transform them for co-benefits and minimised trade-offs.
- Engagement of academia and the necessary practitioners in science, innovation and beyond, that can deliver the necessary scientific methodologies and approaches to support policymakers to put complex transformations into practice.
- The establishment of a broad interdisciplinary network of researchers, scientists, universities and research centres covering a wide diversity of food systems-related disciplines to further systems science methodologies (e.g., modelling, microsimulation...) in this area.
- A strengthened European Research Area for food systems transformation for co-benefits, which promotes gender equality, attracts young talents and fosters inclusiveness.

Scope: Proposals should cover all of the following aspects:

- Federate universities, academics and researchers across Europe to support and engage in inclusive inter and trans-disciplinary research, foster debate, reflexivity and responsible research and innovation (RRI) in support of food systems transition and improved policymaking at all levels from global to local.

- Improve systems science methodologies and capacity for understanding systemic issues related to food systems.
- Monitor and steer foresight that feeds into EU strategic planning by mapping issues and major developments or trends in food systems.
- Develop and share freely available open access educational material/curricula to be used by Higher Education Institutes (bachelors and post-graduate levels) to help strengthen their existing food systems-related teaching and research with an inter and transdisciplinary systems dimension that integrates all three aspects of sustainability, the Farm to Fork policy and Green Deal priorities.
- Support researcher training, mobility, mutual learning and knowledge sharing, and open science approaches, that will accelerate gender equality, attract young talents and foster inclusiveness.
- Establish a high-level liaison with EU and relevant international initiatives.

HORIZON-CL6-2024-GOVERNANCE: The role of mainstream media, social media and marketing in fostering healthy and sustainable consumption patterns and how to encourage good practice or incentives

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX 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.

Expected outcome: In line with the European Green Deal priorities, the farm to fork strategy in particular the Contingency plan for ensuring food supply and food security, healthy and environment-friendly food system, and the EU’s climate ambition for 2030 and 2050, the successful proposal will support R&I to advance the understanding of the role of mainstream media, social media and marketing on fostering (un-)healthy and (un-)sustainable consumption patterns and how to encourage good practice or incentives.

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

- Better understanding of how mainstream media, social media and marketing is impacting consumption patterns / behavior of consumers/ healthy diets and food systems.
- Better understanding of the different media and marketing approaches and channels used by different food system operators and actors.
- Informed policies and business strategies aimed at fostering healthy and sustainable consumption patterns and at encouraging good practices or incentives.

Scope:

Proposals should cover all of the following aspects:

- Evaluate the various techniques and vehicles for spreading information using different mainstream and social media channels (such as apps, websites and platforms), in particular mapping of new communication tools, algorithms and machine learning principles where citizens make food choices.
- Compare the different media and marketing approaches of national/regional/local governments, civil society, and the private sector and examine how these different types of approaches and channels affect consumption patterns and food choices across the different socio-economic groups and cultural groups.
- Analyse and measure the impact of negative news (e.g., information on food safety risks) 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.
- Identify innovative and effective tools to improve communication on sustainable healthy nutrition and diets, and more generally on sustainable food systems adapted to different population groups in respect of their age, culture and needs, and considering gender.
- Develop recommendations for strategies and best practices that can policymakers, civil society, and other food system operators do through communication and outreach efforts to foster healthy and sustainable consumption patterns and to encourage good practice or incentives.

HORIZON-CL6-2023-GOVERNANCE: 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 EUR XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

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:

- 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 governance and especially social innovation contributing to reduced resource consumption and increased innovation capacity of all actors, 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 engagement of all actors (especially focusing on the ‘social enterprise’ model relevant for vulnerable populations).

Scope

- Proposals will benefit from social creativity and opportunities at local/regional scale unleashed for bio-based systems, taking care of their high environmental performances, in terms of feedstock, resources, processes, 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.

HORIZON-CL6-2023-GOVERNANCE: 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 EUR XX 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 XX million
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

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, e.g. for carbon capture and utilisation and related industrial bio-based value chains across the EU, supporting the EU Bioeconomy Strategy Action Plan⁶⁹ 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.

⁶⁹ Action 3.1.3. Study and analysis of enablers and bottlenecks and provide voluntary guidance to the deployment of bio-based innovations

- 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 result in an increased innovation capacity of all actors, and contribute to industrial competitiveness with new products and services.
- 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 considered⁷⁰.
- The proposals will seek complementarities with related actions on governance of bio-based innovation and ensure inclusiveness and engagement of all actors⁷¹.
- International cooperation is encouraged, to benefit from available global best practice.

HORIZON-CL6-2024-GOVERNANCE: Supporting the transition from GHG-intensive economies facing challenges to meet the objectives under the European Green Deal towards circular bioeconomy model regions

Specific conditions

⁷⁰ See parallel topic HORIZON-CL6-2023-ZEROPOLLUTION: Industrial biotechnology approaches for improved sustainability and output of industrial processes

⁷¹ E.g. see parallel topic HORIZON-CL6-2024-GOVERNANCE: Bioeconomy project development assistance

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcomes: In line with the European Green Deal priorities, the EU’s climate targets for 2030 and 2050 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, forestry, and fisheries, and peat production, towards circular bioeconomy model regions;
- Strengthened interactions and coordination between affected European 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 regions to exchange views, best practices and align their work to overcome common challenges
- Identify new bioeconomy structures that generate local green growth in regions currently relying on carbon-intensive economic activities, that would be utilized by the RIA.

HORIZON-CL6-2024-GOVERNANCE: Demonstrating the transition from GHG-intensive economies facing challenges to meet the objectives under the European Green Deal towards circular bioeconomy model regions

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

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 ambition for 2030 and 2050 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 intensive agriculture regions;
- Development of new bioeconomy structures that generate local green growth in regions currently relying on GHG-intensive economic activities, focussing on coal mining and intensive agriculture;
- Strengthened interactions and coordination between affected European 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;

- Interacting and with the theoretical support of the CSA72, support the demonstration of this process in 2-3 selected coal mining regions and 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).

HORIZON-CL6-2024-GOVERNANCE: Bioeconomy project development assistance

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcomes: 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 solution, which will help rural and coastal areas in their just green transition.

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

- Increased access to finance and technical support along all Technological Readiness Levels and whole supply chains for bioeconomy projects, leading to a higher number of successful flagship projects.

⁷² See parallel topic HORIZON-CL6-2024-GOVERNANCE-xx.xx: Supporting the transition from traditional economies facing challenges to meet the objectives under the European Green Deal towards circular bioeconomy model regions (CSA)

- 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

Scope:

- Provide technical assistance for bioeconomy project development and facilitate synergies and linkages between different policy instruments and funding opportunities (e.g. CBE JU, ERDF, CAP, Innovation Fund) and therefore support the deployment of bioeconomy through the streamlining of research, innovation and demonstration.
- Provide expertise and consultancy services to promising bioeconomy projects at different TR levels in the area of business model development (including exploring supply chain options), planning, project documentation and feasibility assessment.
- Bring together and align the goals of primary producers, SMEs, large industry, and other stakeholders in bioeconomy projects along the whole value chain in order to build collaborative partnerships with a strong technical, economic, and legal capacity.
- Focus on the circularity and sustainability aspect of the bio-based sector, including food production, processing and distribution, aiming at rewarding land managers for the provision of ecosystems services (e.g. voluntary markets), algae projects etc.

HORIZON-CL6-2023-GOVERNANCE: 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 EUR XX 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 XX million
<i>Type of Action</i>	Research and innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcomes: 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 enhance the

understanding of the biosphere local potential that contribute to one or more European Green Deal objectives.

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

- Better understanding of the potential of land and biomass to contribute to the climate, biodiversity, environmental, as well as social and economic objectives of the European Green Deal.
- Strong and robust methodology to carry out integrated bioeconomy land use assessments in Europe to quantify the land and biomass use requirement of EU and national policies to the climate, biodiversity, environment, as well as social and economic objectives of the European Green Deal.
- Quantitative data on the use of land in a number of selected regions across EU Member States and their environmental/climate zones.
- Quantifying the potential contribution to climate mitigation and adaptation, biodiversity protection and restoration, and provision of healthy and nutritious food.

Scope:

- Improving understanding of direct and indirect implications on land and biomass use of current and planned regional, national or EU policies, including using and complementing existing data bases.
- Development of a methodology to carry out integrated bioeconomy land use and biomass assessments which will integrate existing and future EU and national policies to meet the environmental, climate, and social targets and assess their land and biomass requirements, taking into account trade-offs and synergies.
- Quantify the contribution of land and biomass use and production to climate targets in case study regions covering different socio-economic situations and climate/ecological zones in Europe.
- Enhance knowledge on factors determining and tools for identifying forest and other land management practices that maximise co-production of ecosystem services, biodiversity restoration and preservation, and net primary production.
- Understand and identify optimum/sustainable land-dependent and land-independent food supply, including through carbon capture utilisation methods, for healthy, safe and sustainable diets.

HORIZON-CL6-2023-GOVERNANCE: Mobilising 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 EUR XX 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 XX million
<i>Type of Action</i>	Coordination and Support Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B. The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected outcomes: 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 as defined in the, the successful proposal will support R&I to strengthen the national bioeconomy networks in BIOEAST⁷³ countries for the development of national bioeconomy action programmes. 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 of the following expected outcomes:

- Strengthened human capacity and competitiveness of the BIOEAST public administrations (ministries, research funding organisations, research institutions etc.) for attracting professionals to ensure 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 stakeholder (ministries, regional authorities, research funding organisations, research organisations, civil society, NGOs and others) engagement and awareness raising and

⁷³ 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). ,

also to facilitate the communication at the regional, national, macro-regional and EU level.

- Mobilisation and increased linkages of national and regional capacities to leverage investments in national education, research, innovation, and 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.
- Identification of the possibilities to increase national investment in Research, Innovation and Development and in Education related to the bioeconomy, including by targeting political commitment, attracting private investors and entrepreneurs and fostering cooperation within countries and across the macro-region.
- Increased participation and innovation capacity of the BIOEAST Member States and stakeholders in the EU framework programmes and structural funds to leverage the full R&I potential in support of the European Green Deal.

Scope:

- Engage with policy makers and address specific barriers to improve the continuity and coordination of the bioeconomy policy development in BIOEAST countries. Bring together national stakeholders in deploying and fostering the bioeconomy related research and innovation developments by engaging local stakeholders into the participation in macro-regional and European thematic networks and into building the common European Research Area.
- Provide advisory support for the development of inclusive national bioeconomy action programmes in support of the European Green Deal, taking care of a transparent and inclusive stakeholder engagement at all levels.
- The proposals will seek complementarities with related actions and past projects on bioeconomy governance and ensure inclusiveness and engagement of all actors.⁷⁴ It is also relevant to cooperate and establish links with relevant existing initiatives such as the BIOEAST Initiative.

⁷⁴ 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.

**HORIZON-CL6-2024-GOVERNANCE: All-Atlantic Ocean Research Alliance -
Implementing the Belem and Galway Statements and the future ambition**

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. Due to the specific challenge of this topic, in addition to the minimum number of participants set out in the General Annexes, proposals shall include participants from South Africa and Brazil. Under this topic, legal entities established in Brazil are eligible for funding from the Union.
<i>Specific conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

Expected Outcome:

This topic will support the implementation of the Green Deal and of the Global Approach to Research and Innovation, and to the UN Decade of Ocean Science for Sustainable Development.

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

- Effective support of coordination of marine and maritime research and innovation activities with Atlantic Ocean stakeholders, with a Pole-to-Pole dimension, aligned with priorities of the All-Atlantic Ocean Research Alliance.
- link with other important EU and international activities such as the Mission Restore Our Ocean and Waters' Atlantic-Arctic Lighthouse CSA (call xxx/xxx/xxx), G7 and G20 related activities, the future Horizon Europe Partnership for a Sustainable Blue Economy, etc., in delivering coordinated activities in the Atlantic Sea Basin, while ensuring links with the Arctic.
- Contributions to the organization, communication, and outreach activities of the governance of the All-Atlantic Ocean Research Alliance work; contribute to the links and inputs of the All-Atlantic Ocean Research Alliance to the UN Decade of Ocean Science for Sustainable Development 2021-2030.

- Consolidated existing initiatives (All-Atlantic Ocean Youth Ambassadors, joint actions, working groups, etc.) building on the outcomes of the 2022 AAORA 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 Alliance Declaration.
- Support to youth programmes and capacity development for early career professionals, and intergenerational activities in favour of communities living on the shores of the Atlantic Ocean.

Scope:

The actions shall aim at understanding and sustainably managing the Atlantic Ocean and its resources as a whole (including fisheries management), 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. In order to achieve this, it is necessary to bring together and systematically connect scientists, stakeholders, data, knowledge, expertise, capacities, infrastructures and resources. This is only feasible through the synergistic cooperation among the Atlantic riparian countries.

Building on the pre-existing cooperative efforts under the Galway and Belém Statements, and on the renewed vision for the All-Atlantic Ocean Research Alliance, this cooperation can 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 shall contribute to upscale cooperation along and across the Atlantic Ocean, including the Arctic and Antarctica, and the upscale of long-term partnerships building also on on-going initiatives such as the All-Atlantic Ocean Youth Ambassadors, joint actions, pledging platform, etc., for the benefit of the All-Atlantic communities, including local ones. This is expected to bring research and innovation results for their benefit and to link early career professionals as well.

Consortia submitting proposals to this topic are encouraged to include participants from countries bordering the Atlantic Ocean as their active participation is key to the success of the proposals.

Heading 2 – Deploying and adding value to Environmental Observations

HORIZON-CL6-2023/2024-GOVERNANCE: Customisation/pre-operationalisation of prototypes end-user services in the area of Climate Change Adaptation and Mitigation

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	PCP
<i>Eligibility conditions</i>	<p>The conditions are described in General Annex B.</p> <p><i>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></p> <p>Project(s) should have a maximum duration of 2 years.</p>

Expected Outcome: A successful proposal will contribute to objectives of the European Green Deal in the domains that benefit from further deployment, uptake and exploitation of environmental observation data and products. It will furthermore contribute to fit-for-purpose environmental observation systems and a strengthened Global Earth Observation System of Systems (GEOSS)

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

- Customisation/pre-operationalisation of prototypes end-user services in the area Climate Change Adaptation and Mitigation, build on the Copernicus 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 PCP in the area of climate adaptation and mitigation;
- 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 growth;
- Enhance understanding of the adverse impacts of climate change on biodiversity and ecosystem functioning and in particular species at risk of climate-related extinctions in sensitive ecosystems to define enhanced adaptation and mitigation actions;
- Demonstrate the empowerment, involvement and reconnection of citizens with nature and should be highly engaging and visible to citizens.

Scope:

The scope of this PCP is to reinforce public demand driven innovation in end-user services in the area of climate adaptation and mitigation. This is needed to close the gap between supply and demand for innovative solutions. Pre-commercial procurement (PCP) has the potential to be an effective demand side innovation action.

Proposals should address the following:

- Launch of PCP – i.e. a joint procurement of research and development services – to find common innovative and sustainable solutions for end-user services in the area of climate adaptation and mitigation.
- Build on the CSA: *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 H2020 (e.g. E-shape, BlueCloud, GDC topic 9.2), and Copernicus services portfolio and use cases experiences.
- 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.
- Activities shall include joint research activities relating to the validation of the PCP strategy and activities for the follow-up of the joint procurement.
- The PCP should deliver successful innovative and fully tested product(s) and/or service(s) that meet the common needs of the buyers' group and that is therefore ready to be marketable, with the final aim of the action is to develop innovative and fully tested solutions, which are fit-for-purpose and cost-effective as end-user services for climate adaptation and mitigation.

HORIZON-CL6-2023-GOVERNANCE: Coordination and supporting action to increase synergies in the dissemination and exploitation of climate observation by World Metrological Organization and its subsidiary bodies

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.

<i>Type of Action</i>	Coordination and Support Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B. <i>To add: reference to ‘international organisations eligible for funding’</i>

Expected Outcome: A successful proposal will contribute 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 WMO, Group on Earth Observations (GEO), Intergovernmental Panel on Climate Change (IPCC) and Global Climate Observation System (GCOS) on climate observations in the context of the European Green Deal;
- Analysis, streamlining and creation of synergies between Work Programmes of above mentioned bodies;
- Promotion of the collection, improvement, dissemination, and exploitation of observations on climate, climate change and its impacts from operational and research observation networks.

Scope:

WMO is hosting the GEO, IPCC, and GCOS secretariats, which are organisations with 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 in this context it is becoming of utmost importance that the EU will benefit from on well-articulated actions between those organisations.

The CSA is intended to:

- support the WMO) and its affiliate bodies the GCOS and IPCC, together with GEO in their common endeavours to collect climate observations and 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.
- Ensure the activities of WMO, and its affiliated bodies such as IPCC or GCOS in collaboration with the GEO will contribute to delivering the information needed by the European Commission to implement its climate related policies.
- Contribute to promote 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) and the Copernicus Climate Change Service (C3S) and Marine Service (CMEMS), and the Global Earth Observation System of

Systems (GEOSS) and through the prominent contributions to GCOS, the Copernicus Programme, and the Climate Change engagement priority of GEO.

- Do the necessary mapping of the respective work programmes and initiatives of the GFCS, Copernicus 3S, GCOS and GEO and identify cross cutting priorities, areas for further collaboration and potential duplications and develop a concrete action plan in collaboration with the respective secretariats of the entities mentioned above.

HORIZON-CL6-2023-GOVERNANCE: 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 XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Actions
<i>Specific conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected Outcome: A successful proposal will strengthen GEO-related coordination mechanisms at European and national levels. The focus shall 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 observations⁷⁵ and to a strengthened Global Earth Observation System of Systems (GEOSS).

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

- Support the EuroGEO community, including the EuroGEO Action Groups, and, as far as possible, link with the future EuroGEOSS; Organisational support, e.g. coordination of EuroGEO communication activities and events, including the increase of synergies among the EU funded projects in context of environmental observations and other topics related to EuroGEO;

⁷⁵ The capacity to observe the environment, including space-based, in-situ-based (air, sea, land) observation, and citizen observations

- A better developed and monitored execution of the EuroGEO Implementation Plan in the GEO Work Programme and preparation of the contribution of the Regional GEOs to the next GEO Strategic Plan covering the period beyond 2025;
- Further developed research policies, guidelines and where possible standards in close relation with the EC Knowledge Centre on Earth Observation.
- 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 and investigating how to achieve the long-term sustainability of the EuroGEO initiative with the GEO Member States and GEO Participating Organisations of Europe.

Scope:

This action aims to prepare the conversion of the existing EuroGEO initiative into a sustainable endeavour, through setting up a secretariat.

The CSA should:

- contribute to the success of EuroGEO by efficiently promoting its three priorities: combining, cooperating and coordinating.
- Address monitoring ongoing research funding activities in Europe and beyond, to serve as the basis for evidence-informed allocation of research funding.
- The project should contribute to the project funded under topic HORIZON-CL6-2024-GOVERNANCE-xx-xx: Development of applications under the EuroGEO initiative.

HORIZON-CL6-2024-GOVERNANCE: Development of applications under the EuroGEO initiative

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Innovative 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 6-8 by the end of the project – see General Annex B.

Expected outcome:

A successful proposal will support the delivery of promising services and solutions developed under the EuroGEO initiative in the context of the thematic areas of the European Green Deal and ensuring a sound follow-up to the e-shape project and of proven pre-operational EO derived services. The successful proposal will be contributing to the European Green Deal objectives by further deploying and exploiting the use of environmental observations⁷⁶ and to a strengthened Global Earth Observation System of Systems (GEOSS).

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

- Support to the development of the European service sector regarding end-user services related to the European Green Deal thematic areas;
- Deliver economic, social and policy value to European citizens through a comprehensive and coordinated suite of services;
- Strengthened Earth observation capacity focused on the European region, including strengthened links between GEOSS and Copernicus, showcasing mutual benefits;
- Better informed policy formulation for the Zero Pollution Action Plan in the domains of air, water and soil pollution;
- Advancements of the EuroGEOSS Digital Ecosystem to take advantage of the wide range of data and services available from different European research infrastructures, citizen science initiatives, and national databases of in-situ observations.

Scope:

This action should be an application-oriented initiative, aimed at promoting existing European showcases developed under relevant H2020 projects and initiatives (such as e-shape) and scaling them up to deliver services relying on existing strengths in Europe in co-design with end-users and customers.

The focus should be on:

⁷⁶ The capacity to observe the environment, including space-based, in-situ-based (air, sea, land) observation, and citizen observations

- A coordinated approach to promote collaboration amongst the GEO members and participating organisations within the European region with actions to be scaled up and develop a comprehensive suite of products, services or solutions
- The project should feed into the EC Knowledge Centre for Earth Observation, the GEOSS infrastructure and Destination Earth Initiative and deliver usable results for coordinating and prioritising technical/scientific developments and evolution of Earth Observation & Copernicus.
- The project should work together with the EuroGEO CSA (HORIZON-CL6-2023-GOVERNANCE -xx-xx: Support to EuroGEO initiative coordination /establishing an EuroGEO secretariat).

HORIZON-CL6-2024-GOVERNANCE: Develop innovative applications to support the European Green Deal building on European meteorological satellite data

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX and XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Specific conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: A successful proposal will deliver new environmental information through the exploitation of Earth observations and promote application development and pre-operational European services through cloud infrastructures. The proposals could support the objectives of the European Green Deal, the Horizon Europe Missions, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Paris Agreement. They should be in line with the European strategy for data and the European digital strategy, 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) and complementing or enhancing the Copernicus services.

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

- Uptake of the newly available environmental information and data at global and regional scale delivered through the Copernicus Sentinels and the EUMETSAT

“Meteosat Third Generation (MTG)” and “EUMETSAT Polar System Second Generation (EPS SG)” satellites with a specific focus on greenhouse gases, air quality, ocean and land biodiversity, high-impact weather events and climate extremes;

- Preparation and implementation of high-quality novel satellite data products using next generation Copernicus and EUMETSAT instruments for the exploitation by advanced physical/chemical/biogeochemical models to improve the implementation and operationalization of new and advanced services and applications;
- Development and demonstration of new applications based on synergetic methods and data products targeting priority needs in the key domains and use of these applications for Earth System predictions, long-term climate monitoring and disaster risk prediction and reduction;
- Exploitation of the European cloud systems and a contribution to the Destination Earth initiative.

Scope:

The projects are expected to:

- Stimulate the uptake and enhance the development of new environmental information delivered through the Meteosat Third Generation (MTG) and EUMETSAT Polar System Second Generation (EPS SG) and explore pre-operational European services through the exploitation of new EO, digital infrastructures and modelling capabilities.
- Turn existing and future EO measurements into new environmental information through the use of advanced algorithms, data assimilation techniques and atmospheric models, including machine learning.
- Build on the MTG and EPS SG satellites, Copernicus Sentinels 4 and 5 and other (Sentinel) missions, to design new methods and data products to exploit the synergies across instruments and platforms and showcase pilot services, which should contribute to the European Green Deal and develop applications using the new environmental products within key domains as enhancements of innovations with respect to already available services.
- Make the tools and services developed under the proposal(s) available for future integration in the Copernicus programme and Destination Earth and ensure the collaboration with EuroGEO and the relevant EuroGEO projects.
- Give attention to how to plan the sustained uptake of services by the European commercial sector.

HORIZON-CL6-2023-GOVERNANCE: Decreasing 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 XX million EUR 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 XX million.
<i>Type of Action</i>	Research and Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B.
<i>Specific conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome: A successful proposal will contribute to the European Green Deal objectives; the Twin Transitions; Destination Earth and the development of Digital Twins; the European Strategy for Data and the European Digital Strategy, a strengthened Global Earth Observation System of Systems (GEOSS) and improvement and better uptake of data services provided by European programmes such as Copernicus (marine, climate, land and emergency services) and the European Marine Observation and Data network (EMODnet).

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

- Increased integrated in-situ observations in the land-sea interface, with particular emphasis on river mouths and estuaries, including enhancing communication and networking between the relevant observation communities;
- An assessment of current in-situ observing capabilities and protocols including issues of spatial and temporal resolution, identification of important gaps and proposals for viable, long-term approaches to address them;
- New methods, protocols, interoperability standards, and technologies for integrated observation in the land-sea interfaces, to combine efficiently earth observation from different sources, including satellite observation, to cover important gaps in the land-sea interface, allowing for the development of seamless and high-resolution data products;
- Improved hydrological and coastal modelling based on the integration of these new sources of in-situ observations and their combination in the land-sea interface.

Scope:

There is a need for increased capacity to assess and develop integrated observation capacities between land and sea, in the coastal zones and beyond, necessary to address priorities related to the European Green Deal objectives

Proposals should address the following:

- Earth observation on the terrestrial and marine domains, including hydrology, with emphasis on the coastal zones and focus on terrestrial/hydrological input to the sea and the sea effect in coastal lands, observations gaps and integration.
- Development of methods, tools, technologies and processes to fill the aforementioned gaps and to increase integrated observing capacity in the land-sea interface.
- Development of interoperability standards between terrestrial and marine data and coordination of existing observation services and networks (EMODnet, Copernicus, GEOSS, WISE, LUCAS, INSPIRE etc. and infrastructures) to promote uninhibited flow of data and to support the creation of common data products in the land-sea interface.
- Advancing forecasting and modelling capacity in the coastal zones, including for predicting hazardous events, addressing habitat loss, addressing shoreline issues such as erosion, detecting/quantifying/managing the impacts of human activity, better integrating river runoffs into marine-related predictions etc.

This topic is part of a coordination initiative between ESA and the EC on Earth System Science. Under the EC-ESA Earth System Science Initiative both institutions aim at coordinating efforts to support complementary collaborative projects, funded on the EC side through Horizon Europe and on the ESA side through the ESA FutureEO programme.

HORIZON-CL6-2023-GOVERNANCE: 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 between EUR XX and XX 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 XX million
<i>Type of Action</i>	Research and Innovation Action
<i>Specific conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected Outcome: A successful proposal will contribute to the wide deployment of, and adding value to, environmental observations for ‘environmental compliance assurance’⁷⁷ by empowering citizens⁷⁸ to promote, monitor, and act in partnership with relevant public authorities, thus contributing to the European Green Deal objectives (in particular zero-pollution, biodiversity and deforestation).

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

- Better and more engage citizens and communities with regional and local authorities, for green and digital transformation;
- More relevant (in-situ) datasets and information, to be used in the context of policy shaping and the use of geospatial intelligence⁷⁹ for ‘environmental compliance assurance’⁸⁰;
- 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.

Scope:

Proposals are expected to:

- Support citizen engagement, specifically the active role of citizens in the collection and use of data and information to complement the data and information collected through other means of observation (statutory reporting, space-based, airborne, etc.).
- Contribute to a broad capacity building for citizens, communities and intermediaries (training the trainer) to collect data and monitor their environment as well as awareness raising activities on environmental compliance assurance, including the (technological) development/improvement of tools to collect the data and information and guidance to act on protecting the environment.
- Link with the European Green Deal Data Space project and, for as far as possible, synergies with the citizen science development efforts of the Destination Earth initiative.

⁷⁷ https://ec.europa.eu/environment/legal/compliance_en.htm

⁷⁸ [Understanding the Citizen Science Landscape for European Environmental Policy: An Assessment and Recommendations](#)

⁷⁹ 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.

⁸⁰ 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](#)

Heading 3 – Digital and data technologies as key enablers

HORIZON-CL6-2023-GOVERNANCE: Strengthening work force and working conditions 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 EUR XX 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 XX million.
<i>Type of Action</i>	RIA

Expected outcome:

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

- Enhancing working conditions in agriculture (including increasing safety of workers and reducing drudgery).
- Lowering environmental impacts and productions costs and increasing product quality in and through the use of digital technologies.
- Reducing the share of risky or unattractive actions/tasks to be performed by workers.
- Overcoming the lack of work force in agriculture in some branches/ regions.

Scope:

- Development of robotic solutions for tasks, for which there is a high interest/ need to support and/ or replace human work force not only because of an interest to improve productivity in an environmentally sustainable way, but also because of strenuous or unhealthy conditions e . Robotics tasks to be fostered might be directly related to agricultural production, such as harvesting, milking, weeding, crop monitoring, animal husbandry or indirectly related, such as logistics/ farm management.
- Strengthening AI capabilities for agro-robotics in these fields across farming systems.
- Use of augmented reality to further increase robotic performance to increase working conditions, safety and failure avoidance.

- Development of business models under consideration of various farm structures and inter-farm linkages as well as of various biogeographic and socio-economic framing conditions.
- The development of such technologies should take into account relevant (forthcoming) legislation, in particular linked to the horizontal Act on AI, the Liability Directive, and Machinery Directive/ Regulation.

HORIZON-CL6-2023-GOVERNANCE: Open source solutions in a computing continuum - from edge to cloud - 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 between EUR XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	Open for international cooperation

Expected Outcome:

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

- Enhancing the sustainability performance and competitiveness of the sector
- Enable the enhanced use of digital tools in areas with weak connectivity
- Enhance the energy balance of data-based solutions used in support of agricultural production
- Develop new approaches towards the development of software for the agricultural sector and increasing its performance, improving operational efficiency through real-time data processing.
- Strengthening (advanced) digital skills of actors related to the agricultural sector

Scope:

- Development of digital applications for farmers following a dual and comparative approach with edge, cloud and mixed solutions; under consideration of the potential of advanced IoT solutions.
- The focus is on (remote) outdoor production processes, where frequently weak connectivity is given.
- Performance of edge and cloud solutions is to be compared in their effectiveness, efficiency and energy performance under consideration of various biogeographic and socio-economic framing conditions.
- The development of software solutions is to follow 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.

HORIZON-CL6-2023-GOVERNANCE: Capitalisation of data spaces for public interest purposes and the agricultural and forestry sectors

To be confirmed

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	RIA
<i>Eligibility conditions</i>	The Joint Research Centre (JRC) may participate as member of the consortium selected for funding

Expected outcome:

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

- Capitalisation of data following a cross-sectoral/ cross-domain approach;
- Increase sectoral sustainability performance through databased solution;
- Increase policy (evaluation) performance through data-based solutions;
- Increase the potential for databased Common good purposes.

Scope:

- The set of Common European Data Spaces will be developed and implemented.
- The individual data spaces will produce data sets of potential relevance for other sectors and domains; this potential is to be used under consideration of the framing legal, governance and business conditions
- The possibility of upscaling data-based solutions for sectors, policy and society at large has to be demonstrated to inform the further targeted evolution of the data spaces and their cross-fertilisation
- Other EU-level data-related initiatives, such as FSDN might be considered

HORIZON-CL6-2023-GOVERNANCE: Digital and data technologies for livestock tracking

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX 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 XX million.
<i>Type of Action</i>	CSA

Expected outcome:

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

- Strengthening sustainable livestock production through the generation of livestock related data sets (including in the field on animal health and disease prevention);
- Strengthening the resilience of supply chain and their transparency through the use of digital technologies;
- Enhancing capacities in policy monitoring and evaluation in the field of agriculture, environment and sustainable finance.

Scope:

- Generate 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
- Develop 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, labelling, predator and pest prevention
- Highlight the potential for upscaling of data-based digital solutions to EU (and international) level.

HORIZON-CL6-2023-GOVERNANCE Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital- and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment

To be confirmed pending analysis of why the topic which was in year 2021 of work programme 2021/2022 did not attract proposals of sufficient quality. If kept, the topic would be adjusted according to the results of the analysis.

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of between EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	

Expected Outcome:

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

- Increase transparency in the markets for digital and data technologies in the agricultural sector and in data sharing in the agricultural value chain, and support competition.
- Lower the risk of investments in digital and data technologies in the agricultural sector.

- Strengthen policy-making and-monitoring and foresight capacities in agriculture and digital and data technologies.
- Contribute to an increased uptake of digital and data technologies in the agricultural sector and indirectly contribute an increase in environmental and economic performance of the agricultural sector through increased and enhanced used of digital technologies and data.

Scope:

- Development of innovative approaches to assess the uptake of digital technologies and digital infrastructure (incl. platforms) in the agricultural sector globally with special attention to the situation in the EU and associated countries.
- Development of innovative approaches to forecast the markets and the uptake of digital technologies and digital infrastructure (including platforms) 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 policies.
- Demonstration of the qualitative and quantitative implications for the use of digital and data technologies by farmers and other actors along the supply chain in a way that demonstration results can be steadily adapted to changing framing conditions. Demonstrations should allow for the reflection of scenarios.

HORIZON-CL6-2023-GOVERNANCE: Digital technologies supporting plant health early detection, territory surveillance and phytosanitary measures

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: A successful proposal should support Regulation (EU) 2016/2031 on protective measures against plant pests and the farm to fork strategy for a transition to fair, healthy and resilient agriculture and forestry.

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

- Develop cost-efficient robust large-scale plant scanning methods to successfully monitor plant pests and assist in the timely eradication or optimize containment measures;
- Innovative and cost-efficient use of sensors and networks for surveillance of EU regulated plant pests affecting agriculture and forestry activities;
- Strengthen capacities to prevent and monitor EU regulated plant important plant pests and support plant health territory surveillance;
- 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 infected plants and/or trees at large spatial scales and within reasonable time frames. The advent of new technology in remote sensing, sensor technologies, robotics, remotely piloted aerial systems (RPAS), the internet of things (IoT), artificial intelligence, and electronics and informatics more generally opens opportunities for monitoring more continuously, more widely, and remotely. These technologies have the potential to guide and instruct on ground surveillance and early detection activities and other phytosanitary measures.

Proposals should:

- Develop early detection strategies by exploiting digital technologies like remote sensing and sensor networks to improve the surveillance efforts and the delimitation of affected areas allowing a regular and rapid monitoring of large areas that are difficult to reach
- Enhance and optimize the use of insect traps in a network setting for an IoT approach.
- Develop sensors and instruments, including through the use of robotics that can monitor a suite of known stress-processes in plants (chlorosis, changes in fluorescence, loss of transportation, etc.) that can be result in plant pest detection and are user-friendly and accessible. Tools should be developed that can be operationally used by end-users to access, use and share data.
- Contribute to further developing remote sensing techniques that can help to distinguish biotic from abiotic stresses to improve the early detection of pests.

- Improve monitoring of plant pests, to collect standardised and comprehensive data, with establishment of early warning systems.
- 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.

This topic could potentially be part of the topics falling within the scope of the joint EC-ESA Earth system science initiatives in the domain of plant health

HORIZON-CL6-2023-GOVERNANCE: Data-driven solutions to foster industry’s contribution to inclusive and sustainable food system

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: This action 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 processes, social engagement, governance and innovation. It will help deliver solutions to advance the European Green Deal priorities, the EU's Climate ambition for 2030 and 2050 and the farm to fork strategy for a fair, healthy and environmentally friendly food system. In particular, it will contribute to improving the data economy for food systems.

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 Practices⁸¹”, an integral part of the farm to fork strategy. Many businesses have already signed the voluntary agreement⁸². This commitment also includes an R&I dimension that can be expanded to the respective topic.

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

⁸¹ EU Code of Conduct on Responsible Food Business and Marketing Practices [f2f_sfpd_coc_final_en.pdf \(europa.eu\)](https://ec.europa.eu/food/sites/default/files/2021-02/f2f_sfpd_coc_final_en.pdf), 2021

⁸² [f2f_sfpd_coc_signatories_0.pdf \(europa.eu\)](https://ec.europa.eu/food/sites/default/files/2021-02/f2f_sfpd_coc_signatories_0.pdf).

- Stimulate industry to exploit data-driven solutions in the food sector so to foster the transition towards sustainable healthy diets for all.
- Increase 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.

Scope:

Proposals are expected to address the following:

- Analysing current systems of private data sharing in the food system (monetary incentives, actors involved);
- Initiating first tests of potential data sharing, also with smaller actors, to analyse potential impact and serve as a lighthouse;
- Making use of analytics and possible foresight to define influential factors of making sustainable choices;
- Defining ways to use data to inform and guide consumer choices at the point of purchase in line with EU food law and policies;
- Setting up a potential framework for sharing non-competitive data to foster sustainable food system objectives that ensures the protection of private data and explore how this data can be integrated in ‘Smart communities data space’.

HORIZON-CL6-2024-GOVERNANCE: Inclusive usage of beneficial digital technologies to drive uptake of healthy and overall sustainable diets

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million.
<i>Type of Action</i>	Research and Innovation Action
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Expected outcome: This action 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 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. In particular, it will contribute to improving the data economy for food systems.

The overall aim of this topic and associated R&I activities is to enhance the inclusive uptake of beneficial digital and transparency technologies to enhance sustainable food system transformation and reduce the digital divide by using democratization.

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

- Ensure that all parts of the society are benefitting from technologies in the food system fostering uptake of healthy and sustainable diets and reducing the environmental impact
- Enhance uptake of beneficial technologies in the food sector and particularly closing gaps across generations, socio-economic characteristics and countries.

Scope:

Proposals are expected to address the following:

- Defining barriers and drivers of technological uptake linked to healthy and safe diets taking into account socio-economic factors
- Applying behavioural economics to analyse how citizens react to changes in their way of living and using technologies, also in connection with ongoing European initiatives, such as local digital twins.
- Creating inclusive ways to ensure uptake of digital food-related solutions that enhance sustainable food system transformation and healthy diets respecting relevant EU and national legal and policy frameworks.
- Making use of current usage of digital solutions by youth and how to elevate beneficial usages to other age groups while respecting national educational, health and nutritional policies.
- Fostering the use of digital solutions to foster local food production/transformation and short supply chains for healthy and sustainable diets.

Heading 4 – Strengthening agricultural knowledge and innovation systems (AKIS)

HORIZON-CL6-2023/2024-GOVERNANCE: 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 EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected Outcome: In support of the Green Deal, 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 need 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 improve sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁸³), thereby add 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 captured and spread sufficiently. 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 up local solutions up to the EU level and may even influence policy design wherever useful.

⁸³AKIS 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)

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

1. 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 uptake⁸⁴, as well as to the European Green Deal and Farm to Fork Strategy objectives and targets.
2. 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.
3. 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 most often.
4. 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.
5. 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 experience 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 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.

⁸⁴ Art 5 CAP post 2020 proposal

- 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, including also 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 which are strongly recommended to involve⁸⁵, 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 minimum 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-CL6-2023/2024-GOVERNANCE: Thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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:

⁸⁵ According to the requirements of the multi-actor approach

	<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>
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Expected Outcome: In support of the Green Deal, 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 need 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 improve sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁸⁶), thereby add 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 captured and spread sufficiently. 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 of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁸⁷, 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 that farmers/foresters most often consult.

⁸⁶AKIS 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)

⁸⁷ Art 5 of the post 2020 CAP regulation

- 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.
- 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, 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 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 which are strongly recommended to be involved⁸⁸, 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.

⁸⁸ 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 activating farmers/foresters, farmers' groups and advisors; and run for minimum 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: Organic farming thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected outcome: In support of the Green Deal, 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 need 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 improve sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁸⁹), thereby add 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.

⁸⁹AKIS 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)

Despite the continued funding of scientific projects, new knowledge, innovative ideas and methods from practice are not captured and spread. The often 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 the following outcomes:

- Contribution to cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁹⁰, 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 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 consult most often.
- Increased flow of practical information between farmers 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 organic farmers' needs by summarising, sharing and presenting – 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, but not sufficiently known or used by practitioners. The specific subthemes of the networks can be chosen in a 'bottom-up' way.
- Compile a comprehensive description of the state of current organic 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

⁹⁰Art 5 of the post 2020 CAP regulation

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. 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 in the 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).
- In addition to giving the details on the EIP Operational Groups which are strongly recommended to be involved⁹¹, 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.
- 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 run for minimum 3 years.
- In order to better reach and capture knowledge from the targeted farmers, the networks may organise 'cross-fertilisation' through sub-networks covering, for example, a region, a language or a production system.

HORIZON-CL6-2023-GOVERNANCE: Biodiversity thematic networks to compile and share knowledge ready for practice

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX million.
<i>Type of Action</i>	Coordination and Support Actions

⁹¹According to the requirements of the multi-actor approach

<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.
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Expected outcome:

In support of the Green Deal, 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 need 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 improve sustainability. They will contribute to effective Agriculture Knowledge and Innovation Systems (AKIS⁹²), thereby add 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 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 the following outcomes:

- Contribution to 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 uptake⁹³, 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, but not sufficiently known or used by practitioners.
- 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 consult most often.

⁹²AKIS 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)

⁹³ Art 5 of the post 2020 CAP regulation

- 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 related to biodiversity 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:
 1. Incentives from farmers and foresters to improve biodiversity on farm or across farms in a collaborative way
 2. EU requirements for biodiversity protection in agricultural areas (Birds and Habitats Directives).
- Compile a comprehensive description of the state of current farming practices on biodiversity 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, 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 the 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 which are strongly recommended to be involved⁹⁴, 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.
- 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 minimum 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: Developing EU advisory networks on organic agriculture

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected Outcome: In support of the Green Deal, Organic Action Plan, the Common Agricultural Policy (CAP) and Farm to Fork and Biodiversity strategies' 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 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 ones required within the Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors strongly guiding

⁹⁴According to the requirements of the multi-actor approach

and with a big influence on producers' decisions. A novelty in the post-2020 CAP plans⁹⁵ 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 be able to cover economic, environmental and social domains, as well as be informed on up-to-date science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt those to specific local circumstances. This specific topic focuses on the important role that advisors can play in relation to boosting organic farming to reach 25% of the EU's agricultural land use by 2030.

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 Organic Action Plan, the Farm to Fork Strategy and the new CAP, with a view to increase sustainability of farming, 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 in agriculture and rural areas, and encouraging their uptake⁹⁶;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to practical organic farming issues, such as bottlenecks, lock-ins, political inertia, ambiguous regulations, inequality between Member States and power imbalances;
- Production of supporting services and materials, networks and peer-to-peer counselling, master classes, advice modules, communication and education materials, etc. to facilitate the upscaling of organic farming as a mean to improve sustainability of agriculture;
- Speed up of the introduction, spreading and bringing into practice of innovative solutions related to organic farming 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 having a broad and extensive network of farmers across all EU Member States in an EU advisory network dedicated to organic farming, including farming techniques which support organic farming, with a view to sharing experiences on how to best tackle the issues, building on the outcomes of the EIP-AGRI Focus Groups and

⁹⁵ Art 13(2) of the post 2020 CAP regulation

⁹⁶ Art 5 CAP post 2020 proposal

Workshops on organic farming as well as the H2020 Thematic Networks related to organic farming.

- Share effective and novel approaches among the EU advisory network on organic farming, which are sustainable in terms of economic, environmental and social aspects.
- Fill gaps on emerging advisory topics beyond the classical sectorial advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS which must cover a much broader scope than in the former period.
- 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 organic farming network into their MS AKIS as much as possible. They should encourage as innovation brokers 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 organic farming 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 organic farming 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. Seek if 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 organic farming 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-CL6-2023-GOVERNANCE: Developing EU advisory networks on pesticide use reduction

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected Outcome: In support of the Green Deal, Common Agricultural Policy (CAP), Farm to Fork and Biodiversity strategies’ and the Zero Pollution Action Plan 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 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 ones required within the Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors strongly guiding and with a big influence on producers’ decisions. A novelty in the post-2020 CAP plans⁹⁷ 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 be able to cover economic, environmental and social domains, as well as be informed on up-to-date science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt those 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.

Project results are expected to contribute to the following outcomes:

⁹⁷ Art 13(2) of the post 2020 CAP regulation

- 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 and the new CAP, with a view to increase sustainability of farming, help raise awareness and tackle societal challenges in helping the reduction of pesticide risks and use;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake⁹⁸;
- Development of interaction with regional policymakers and of a potential EU network to discuss institutional challenges to practical pesticide use and risks reduction issues, 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, such as more sustainable farming techniques (e.g., Integrated Pest Management), use of biopesticides, 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, spreading and bringing into practice of innovative solutions related to pesticide use and risks reduction 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 having a broad and extensive network of farmers across all EU Member States in an EU advisory network dedicated to pesticide use and risks reduction, including farming techniques which support pesticide use and risks 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 H2020 Thematic networks related to pesticide use and risks reduction.
- Share effective and novel approaches among the EU advisory network on pesticide use and risks reduction, which are sustainable in terms of economic, environmental and social aspects.

⁹⁸ Art 5 CAP post 2020 proposal

- Fill gaps on emerging advisory topics beyond the classical sectorial advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS which must cover a much broader scope than in the former period.
- 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 pesticide use and risks reduction network into their MS AKIS as much as possible. They should encourage as innovation brokers 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 organic farming 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 risks reduction 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. Seek if 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 organic farming 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-CL6-2023-GOVERNANCE: Developing EU advisory networks on forestry

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected Outcome: In support of the Green Deal, Common Agricultural Policy (CAP) and new EU Forestry Strategy 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, which accelerates the needed 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 ones required within the Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors strongly guiding and with a big influence over producers’ decisions. A novelty in the post- 2020 CAP plans⁹⁹ 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 informed on up-to-date science and technology. They should be able to translate this knowledge into opportunities, and use and adapt those to specific local circumstances. This specific topic focuses on the important role advisors can play related to more sustainable forestry in the future. 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 new EU Forestry Strategy and the new CAP,

⁹⁹ Art 13(2) of the post 2020 CAP regulation

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 in agriculture and rural areas, and encouraging their uptake¹⁰⁰;
- 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;
- Speed up of the introduction, spreading and bringing into practice of innovative solutions related to forestry, in particular by:
 - a. creating added value by better linking research, education, advisors and foresters 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 having 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 H2020 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.
- Fill gaps on emerging advisory topics beyond the classical sectorial advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS which must cover a much broader scope than in the former period.
- Provide overall support related to knowledge creation, organisation and sharing.

¹⁰⁰ Art 5 CAP post 2020 proposal

- 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 MS 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 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. Seek if 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-CL6-2023-GOVERNANCE: Developing EU advisory networks on sustainable livestock systems

Specific conditions	
<i>Expected EU contribution per project</i>	The EU estimates that an EU contribution of around EUR XX 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 XX 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.

Expected Outcome: In support of the Green Deal, Organic Action Plan, the Common Agricultural Policy (CAP) and Farm to Fork and Biodiversity strategies' 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 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 ones required within the Green Deal are dynamic processes that require appropriate governance of AKIS actors. Advisors are key actors strongly guiding and with a big influence on producers' decisions. A novelty in the post-2020 CAP plans¹⁰¹ 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 be able to cover economic, environmental and social domains, as well as be informed on up-to-date science and innovation. They should be able to translate this knowledge into opportunities, and use and adapt those 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 EU Forestry Strategy and the new CAP, with a view to improve sustainability of forestry, help raise awareness and tackle societal challenges related to sustainable livestock systems;
- Support to the CAP cross-cutting objective of modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake¹⁰²;
- 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;

¹⁰¹ Art 13(2) of the post 2020 CAP regulation

¹⁰² 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;
- Speed up of the introduction, spreading and bringing into practice of innovative solutions related to sustainable livestock systems, in particular by:
 - c. creating added value by better linking research, education, advisors and farming practice and encouraging the wider use of available knowledge across the EU;
 - d. 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 having 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 H2020 Thematic Networks related to sustainable livestock systems.
- Share effective and novel approaches among the EU advisory network on livestock systems, which are sustainable in terms of economic, environmental and social aspects.
- Fill gaps on emerging advisory topics beyond the classical sectorial advice, which is useful in particular in relation with the new obligation for Member States to integrate advisors within their AKIS which must cover a much broader scope than in the former period.
- 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. They should encourage as innovation brokers 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. Seek if 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.

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Other actions not subject to calls for proposals

1. Support to the International Resource Panel (IRP) Secretariat

The International Resource Panel (IRP) is a science-policy interface which aims to build 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 its strategic direction, ensures policy relevance, helps setting the work programme, oversees budgets and provides advice on the scientific make-up of the Panel. IRP findings have been used by the Commission in shaping the European Green Deal and have informed resolutions of the United Nations Environment Programme. The IRP work is often quoted or at the basis of G7/G20 documents and communiqués related to sustainable consumption and production, resource efficiency and the circular economy.

The EU will provide a financial contribution to the IRP to implement the IRP work programme 2022-2025, adopted in December 2021, 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; and to strengthen the synergies between Horizon Europe 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.

Legal entities:

IRP Secretariat, hosted by the United Nations Environment Programme (UNEP) with its seat located at UNEP's Economy Division, 1 Rue Miollis, Building VII, 75015, Paris, France

Type of Action:

Grant to identified beneficiary - Coordination and support actions

Indicative timetable: 1st Quarter 2023

Indicative budget: EUR XX million from the 2023-4 budget

2. (2023) Towards a European Bioeconomy Council

Specific conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of EUR XX 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 XX million

<i>Type of Action</i>	Public procurement
<i>Eligibility conditions</i>	The conditions are described in General Annex B.

Political debates on bioeconomy need to be conducted with the involvement of wider society at EU level, to represent and take into account societal needs, which contribute to the achievement of EU sustainable and circularity goals. A European bioeconomy council would foster an open and structured dialogue with all stakeholder groups (including leading experts from industry, NGOs, civil society) to define a constructive pathway that unlocks the potential of the bioeconomy. Such a council would complement the activities of the European Bioeconomy Policy Forum (EBPF).

The objective of this action is to carry out a scoping study to have a better understanding of the gaps on this matter, and define how such a council could work (goal and specific objectives, governance, selection mechanisms of the members, activities and related frequency, interactions with policy-makers...). The study should include an impact assessment.

Type of action: Public procurement

Indicative timetable: 2023

Indicative budget: EUR XX million from the 2023 budget

3. (2024) 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 engaged in testing and improving circularity in their territories, economic sectors, value chains and services.

Nevertheless, the 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 effectively the circular economy concept in urban and regional policy areas beyond traditional resource recovery in waste and water sectors.

The Circular Cities and Regions Initiative (CCRI) 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 at local and regional scale. The CCRI's activities aim to contribute to the implementation of the European Green Deal¹⁰³, the circular

¹⁰³ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

economy action plan¹⁰⁴ and the bioeconomy strategy¹⁰⁵. The CCRI Coordination and Support Office is currently implemented via a framework contract with a 4 years duration (from October 2021 until October 2025).

The objective of this new action is to continue and strengthen the coordination and support service for the implementation of the CCRI at local and regional level beyond October 2025. It will also ensure the cooperation among the CCRI's projects covered under the Horizon 2020 Green Deal Call and Horizon Europe and relevant initiatives and stakeholders.

The aim of this action is therefore the launch of a new Framework contract (FWC) for a duration of 2 years with an estimated budget ceiling of EUR XX 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 the signature of specific contracts 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 2024

Indicative budget: No budget needed in 2024

4. GEO subscription 2023-2024 (XX million, for 2023 and 2024)

An annual contribution to the 2021 and 2022 activities of the GEO Secretariat, as a subscription to a body of which the Union is a member, according to Article 239 of the Financial Regulation applicable to the general budget of the European Communities (2018).

As a full member of the Group on Earth Observations (GEO) the Commission will pay a contribution on behalf of the EU to the GEO Trust Fund, which is the budgetary structure agreed by the GEO members to fund the GEO secretariat (hosted by the World Meteorological Organisation in Geneva, Switzerland), to ensure the implementation of the Global Earth Observation System of Systems (GEOSS) according to its annual work plan and the continuity of the leadership and participation of the EU in GEO.

Type of Action: Subscription action

Indicative budget: EUR XX million from the 2023 budget and EUR XX million from the 2024 budget

¹⁰⁴ https://ec.europa.eu/environment/pdf/circular-economy/new_circular_economy_action_plan.pdf

¹⁰⁵ https://ec.europa.eu/info/research-and-innovation_en

5. Scientific and technical services by the Joint Research Centre: Leveraging European data-sharing and exploitation practices within GEOSS (Global Earth Observation System of Systems) (XX million, 2024 (for years 2024 – 2026))

The next generation EuroGEOSS will leverage on 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 the European values, legal framework and 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 the ICT developments, within 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 development of additional use cases in line with the priorities of the Commission and the regional development agenda;
3. Expansion of the approaches and technological stack of EuroGEOSS to other regions, specifically in Africa and the ENPI countries, 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

6. Grant to a named beneficiary to ESA for the GEOSS portal (continuation Geoportal Platform Plus project) (XX million, 2024 (for 2024 – 2025))

The GEOSS 3.0 infrastructure is aimed at serving the GEO community to enable access to tailor-made information and actionable knowledge with a user-centric approach. The GEOSS infrastructure will propose services to non-specialists in the domain of adaptation to extreme climatic events and to changes in climatic conditions. Drivers for this will be:

- (i) the lessons-learned from the evaluation of the implementation of the EU Strategy on Adaptation to climate change (COM(2018)738)),
- (ii) (ii) the priorities identified under the European Green Deal and
- (iii) (iii) the requirements expressed by the Mission on Adaptation to Climate Change including Societal Transformation.

The project aims to fully exploit the GEOSS infrastructure and its components to the benefit of the users, to enable the connections with the data providers (including in-situ), which are relevant for the achievement of use cases, and to provide a user-friendly, up-to-date and therefore familiar environment, by making sure that the current trends in information

technology are considered and exploited as necessary. By establishing synergies with relevant initiatives in the European landscape, the updated infrastructure will concur to reinforce the European participation and leadership in GEOSS.

Legal entities: ESA/ESRIN, Via Galileo Galilei Casella Postale 64, 00044 Frascati (Roma), Italy

Type of Action: Grant to identified beneficiary - Coordination and support actions

Indicative timetable: 4th Quarter 2024

Indicative budget: EUR XX million from the 2024 budget

7. Service Level Agreement with EEA “Enhancing the access to in situ Earth observation data in support of climate change adaptation policies and activities” (XX million, 2024 (for 2024 – 2027))

A contribution for three years (2024-2027) to the European Environment Agency (EEA) will contribute to 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 facilitating the access and availability of in-situ data (including from citizen science and Horizon Europe projects) as well as socio-economic data relevant for the implementation of the “Mission on Adaptation to climate change”, the EU Adaptation Strategy and the future Digital Twin on Climate Adaptation. This action will support the development of the activities with a European focus foreseen within the In Situ Data Strategy for GEO (Group on Earth Observations), as an integral component of the EuroGEO initiative launched by the European Commission.

This work will benefit from the unique role of EEA as coordinator of the Copernicus In-Situ Component and of the CLIMATE-ADAPT platform, as well as a lead in the work around in-Situ Earth Observation data carried out within GEO.

Indicative duration: 36 months

Type of Action: Service Level Agreement

8. Support the clustering of ESA-RTD projects in the domain of Earth System Science (ESS projects) (XX million, 2024)

The ESA-Commission Earth System Science initiative is a new initiative coordinated between the Horizon Europe Programme and the ESA Future EO programme including the following flagships: polar systems, ocean systems, biodiversity systems, climate systems, water systems and hazards.

The ambition of the collaboration between ESA and Horizon Europe is to bring together R&I assets and observation assets to fruition with the objective to support major breakthrough in Earth System Science. The ESA-EC Earth System Science initiative will materialise in the course of 2024 as a group of complementary projects pursuing a common objective in the domain of Earth System Science (e.g., in the domains of the flagships). The EC projects should support R&I actions eligible under Horizon Europe while ESA projects should support development and access to novel space assets, ESA science and research, and open science infrastructure.

The overall objective of this action will be to create a cluster of ESA-RTD projects in support to relevant EU policies and programmes.

The detailed objectives are:

- 1) To develop the clustering modalities/governance necessary for the organisation of the cluster with the participation of ESA and the relevant Commission DG's and agencies.
- 2) To facilitate the interactions between the ESA and Horizon Europe projects to ensure complementarity between the ESA and Horizon Europe projects and facilitate the communication, dissemination and especially exploitation between the projects.
- 3) To develop a communication, dissemination and exploitation plan for the cluster of projects in order to provide regular updates of the advancement of the projects towards the Science Community and policy actors implementing the European Green Deal.
- 4) To implement this communication plan via the development of the necessary media allowing an easy and broad access to the information of the cluster.
- 5) To organise where relevant the synergies with the Copernicus Programme, Destination Earth, the Group on Earth Observations, the EuroGEO initiative, and the Horizon Europe Missions and Partnerships.
- 6) Organise regular events of the cluster to promote its activities and disseminate outcomes.

Furthermore, this action should look into the future of the cluster by delivering a longer plan to sustain the actions of the cluster.