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Forschung wirkt.

**Call Topics for International Cooperation  
in Horizon 2020  
EU and China**

20.09.2019

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## Industrial Leadership

<b>Horizon 2020 Pillar:</b>	Industrial Leadership
<b>Programme:</b>	Leadership in enabling and industrial technologies (LEIT)
<b>Call Title:</b>	Foundations for Tomorrow's Industry
<b>Call Identifier:</b>	h2020-nmbp-to-ind-2018-2020
<b>Topic Title:</b>	Safe by design, from science to regulation: multi-component nanomaterials (RIA)
<b>Topic Identifier:</b>	NMBP-16-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	12.12.2019, 14.05.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/nmbp-16-2020>

**Specific Challenges:** Complex multi-component, hybrid, functional nanomaterials and High Aspect Ratio Nanoparticles (NMs&HARNs), present both innovation potential and challenges in terms of assessing the risk in different environments. Concerns for these multi-component nanomaterials result from differing rates of degradation and toxicities of the separate and interacting components and their different interactions with biological and environmental systems. Previous projects on Safe by Design have developed risk assessment tools and strategies, however they were only implemented within the context of an example case study. The implementation of these tools and approach at scale is still remains to be achieved. The challenge is to develop and implement Safe by Design concepts for products incorporating such nanomaterials and to understand their impact on manufacturing processes, on product performance, and on the environment and on health.

**Scope:** The proposals should:

- Coordinate with the projects from NMBP-15-2019, and focus on filling the gaps in the current understanding of exposure and hazard characteristics of NMs&HARNs especially those arising from their unique properties, as well as assessing the extent of and rates by which variations of environment modify the nanoparticle properties and agglomeration rates;
- Use multiscale modelling approaches to identify how different patterns of release may influence physiological responses and how elements of multi-component nanomaterials interact with each other, with other NMs, and other chemicals leading ultimately to mixture toxicity;

Develop knowledge and tools for Safe by Design approaches that support the development of multi-component nano-enabled products with reduced persistence, exposure and hazard. This should be coupled with developing multi-scale modelling approaches to evaluate the effectiveness of the proposed safe-by-design strategies

Relevant indicators and metrics, with baseline values, must be clearly stated in the proposal and should be in line with previous efforts on Safe by Design. For this topic a parallel call scheme is envisaged with the USA-NNI. Resulting projects should establish close cooperation mechanisms. Therefore, proposals should foresee a dedicated work package for cooperation and earmark appropriate resources.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

#### **Expected Impact:**

- Implementation of validated safe-by-design strategies including enabling their uptake and utilization by SMEs;
- Recommendations on adaptation and improvement of current guidelines for exposure and hazard assessment of multi-component NMs as necessary;
- A categorisation scheme to cluster sector-specific multi-component nanomaterials by assessing nano-specific properties in real-life environments;
- Integration of specific characteristics of multi-component NMs, including the potential for mixture effects, in risk assessment and safe-by-design strategies.

#### **Call information:**

##### GOVERNANCE, SCIENCE-BASED RISK ASSESSMENT AND REGULATORY ASPECTS

Managing the risks of every emerging technology is of key importance for its societal acceptance and consequent possible success. The overall challenge is to establish a suitable form of nanotechnology risk governance and to ensure that beyond the state of the art technologies are accepted by stakeholders (civil society, industry, regulators).

This requires working on three different layers:

- (i) a scientific research layer for sound foundations,
- (ii) a regulatory research layer to validate and translate the scientific findings into appropriate regulatory frameworks and implementation, and
- (iii) a market layer dealing with the daily management of risks and safety.

These three distinct layers should be integrated through actions for risk governance, risk assessment and safe by design. Notably nano-informatics approaches offer good chances for innovation. These will include the challenge of ensuring consistency in all EU Member States in terms of risk management.

The present convergence of several sciences and the rapid evolution of novel technologies in the healthcare sector create a need for fast advance in regulatory science in that sector. Development and adoption of reference methods and of technical standards should be based on solid scientific foundation, hence the need for additional activities within regulatory science for medical technology products.

In terms of resources, the regulatory layer should be jointly supported by Horizon 2020, Member States governments and industry whereas at market level, Horizon 2020 should support only the networking and coordination. Proposals in all layers can foresee modalities for integrating additional public or private funding or foresee specific calls for proposals funded by these additional sources. Costs for the organisation of the calls and coordination of the work can be foreseen in proposals' budgets. Such calls can also be used to foster international cooperation in nanosafety.

Proposals in this area should apply the Open Access and the Open Data Access policies and strongly support the activities of EU regulatory bodies and agencies, and of international organisations like ISO, CEN and OECD. To maximise overall synergy and joint impact, projects should take account of the strategy and roadmaps in place, respect and complement the established ontology and the data logging format (ISA-TAB-NANO<sup>[1]</sup>), contribute to the objectives of relevant platforms (such as the EU NanoSafety Cluster<sup>[2]</sup> or The Nanomedicine Translation Hub) and foresee the necessary resources to this effect.

Nanosafety issues are global and, therefore, international collaboration is strongly encouraged. In particular, all projects in this area are expected to collaborate with similar projects under the established scheme of Communities of Research with the USA NNI programme<sup>[3]</sup> and/or to include direct participation of relevant USA entities. In addition, participation from countries actively involved in the work of OECD -WPMN, the NanoSafety Cluster and the NANoREG<sup>[4]</sup> project (e.g. South Korea, Brazil, Canada, Australia, **China**, Japan, South Africa) is strongly encouraged.

Proposals should consider risk-assessment procedures for both men and women, where relevant, and enable a reduction of animal testing in the regulatory compliance.

**Cross-cutting Priorities:** Open Science, Open Innovation, International cooperation

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[1] <http://enanomapper.net>

[2] <http://www.nanosafetycluster.eu>

[3] <http://www.us-eu.org>

[4] <http://www.nanoreg.eu>

<b>Horizon 2020 Pillar:</b>	Industrial Leadership
<b>Programme:</b>	Leadership in enabling and industrial technologies (LEIT)
<b>Call Title:</b>	Competitive, low carbon and circular industries
<b>Call Identifier:</b>	h2020-low-carbon-circular-industries-2020
<b>Topic Title:</b>	ERA-NET on materials, supporting the circular economy and Sustainable Development Goals
<b>Topic Identifier:</b>	CE-NMBP-41-2020
<b>Type of Action:</b>	ERA-NET-Cofund ERA-NET Cofund
<b>Deadline(s):</b>	05.02.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-nmbp-41-2020>

**Specific Challenges:** Maintaining Europe's position in research related to materials science and engineering requires concentrated action on common European research priorities in view of implementing joint initiatives.

The M-ERA.NET 2 network has successfully targeted the Low Carbon Energy Technologies addressed by the SET Plan. Now the scope should on one hand guarantee some continuation, and on the other hand become more ambitious and underline the commitment of the EU regarding the circular economy and Sustainable Development Goals.

The European Commission has adopted an ambitious new Circular Economy Package to help European businesses and consumers to make the transition to a stronger and more circular economy. Moreover, in 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development came into force. They aim to end poverty, protect the planet, ensure prosperity and tackle climate change. The EU is fully committed to be a frontrunner in implementing the 2030 Agenda and SDGs. Finally, the Commission launched the Battery Alliance initiative in 2017.

Materials research is a relevant field for addressing these overall challenges and for making substantial contributions to achieving the specific objectives.

Global challenges call for co-operation on a global scale to build capacity in science, technology and innovation (STI) at both national and international levels. A strategic and industrially relevant approach is needed that cover the entire research and innovation chain by pooling national research and innovation capacities, thereby mobilising European infrastructure networks as well as promoting education and training in materials research and innovation.

**Scope:** The proposed ERA-NET aims at coordinating the research efforts of the participating Member States, Associated States and Regions in the field of materials, continuing the activities started by M-ERA.NET, for materials research and innovation, especially targeting the circular economy and Sustainable Development Goals (such as Goal 7 – “Affordable and clean energy”, by enabling electromobility through sustainable energy storage technology or Goal 9 “Industrial innovation and infrastructure”, by enhancing scientific research and upgrading the technological capabilities of industrial sectors). Proposals should pool the necessary financial resources from participating national or regional research programmes by implementing a joint transnational call for proposals (resulting mainly in grants to third parties) with EU co-funding to fund multinational innovative research initiatives in this domain, including support to the large scale research initiative on future battery technologies launched under the H2020-LC-BAT-2019-2020 Call<sup>[4]</sup>.

Proposers are also requested to implement other joint activities and, additional joint calls without EU co-funding. The proposal should demonstrate that these additional joint calls exclude any overlaps with related on-going actions co-funded by the EU under NMBP.

Proposals should demonstrate the expected impact on national and transnational programmes as well as the leverage effect on European research and competitiveness, and should plan the development of key indicators for supporting this.

Participation of legal entities from **third countries**, and/or regions including those not automatically eligible for funding in accordance with General Annex A is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from countries not listed in General Annex A are eligible for EU funding under this topic and may request a Union contribution (on the basis of the ERA-NET unit cost) only for the coordination costs of additional activities.

The Commission considers that proposals requesting a contribution from the EU of EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. EUR 5 million of the requested contribution from the EU should be used as support to transnational projects, co-funded by the Commission, on future battery technologies, fostering synergy between European, national and regional initiatives and promoting broader partnerships between the European stakeholders in future battery technologies.

**Expected Impact:**

- synergies with international, national and regional programmes that support research and innovation;
- synergies but no overlap with the topics of Horizon 2020 and with related European Partnership initiatives and be open to adapt to future coming initiatives of Horizon Europe;
- leverage of national, regional and European funding;
- contribution to meeting Global Challenges through Better Governance: International Co-operation in Science, Technology and Innovation;

- relevant contribution to the SDGs, including sustainable battery based energy storage technology;
- relevant contribution towards a circular economy.

**Cross-cutting Priorities:** ERA-NET

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[1] [http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-cc-activities\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-cc-activities_en.pdf)

<b>Horizon 2020 Pillar:</b>	Industrial Leadership
<b>Programme:</b>	Leadership in enabling and industrial technologies (LEIT)
<b>Call Title:</b>	Transforming European Industry
<b>Call Identifier:</b>	h2020-nmbp-tr-ind-2018-2020
<b>Topic Title:</b>	New biotechnologies to remediate harmful contaminants (RIA)
<b>Topic Identifier:</b>	CE-BIOTEC-08-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	15.04.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/ce-biotec-08-2020>

**Specific Challenges:** Environmental pollution is a major global issue affecting natural resources and the environment in generic terms and creating important concerns for human health in particular. Pollutants resulting from human action are detrimental to ecosystems at different functional levels, representing an important economic load for society.

Standard remediation strategies have different levels of efficiency; in certain cases they increase the health risk of workers or simply postpone the problem. Advanced bioremediation approaches, which use naturally occurring microorganisms, in the form of emerging technologies for the treatment of contamination in various ecosystems foresee more sustainable and gentle alternatives to physicochemical options. These technologies comprise, amongst others biomineralisation, electrobioremediation, microbe-assisted phytoremediation, protein and metabolic engineering, nano-biotechnology and systems biology.

While the merits of using microorganisms to depollute their environment and to transform harmful contaminants into harmless end-products are well known (environmental friendliness, low toxicity), a number of challenges remain. These include for instance, their effectiveness to treat compounds that are not biodegradable (e.g. toxic metals), time efficiency, specificity of the environment, level of concentration of the contaminants, the combined biological activity of the microbial community over time and space and the consumption of energy.

**Scope:** Proposals should cover the following activities:

- Research and innovation for efficient and low cost remediation strategies using microorganisms by means of emerging biotechnologies that require

minimum or zero external energy or chemicals and that reduce the remediation time compared to physicochemical processes;

- Work to ensure remediation in soil, sediments, mines, surface water, groundwater or industrial water;
- Develop a system to remove different contaminants, including complex mixtures, covering hydrocarbons and their derivatives, recalcitrant compounds, metals, nanomaterials, paints and coatings, nutrients, pharmaceuticals or micropollutants and toxic contaminants;
- Include field trials to prove an acceptable performance for field applications will be a plus.

This topic is part of the EU-**China** flagship initiative on Biotechnology for Environment and Human Health, which will promote substantial coordinated and balanced research and innovation cooperation between the EU and **China**. **China**-based legal entities<sup>[1]</sup> have to apply for funding under the **Chinese** co-funding mechanism with the National Natural Science Foundation of **China** (NSFC)<sup>[2]</sup>.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Activities should start at TRL 3 and achieve TRL 6 at the end of the project.

The Commission considers that proposals requesting a contribution from the EU between EUR 4 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

#### **Expected Impact:**

- Remediation of at least two toxic contaminants of different nature;
- Proof of the feasibility to scale up the technology for field testing, including an assessment of the related environmental benefits and risks;
- A quantified demonstration of the benefits compared to standard physicochemical remediation approaches, in particular regarding time and energy efficiency.

Relevant indicators and metrics, with baseline values, including demonstration activities should be clearly stated in the proposal.

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[1] Article 14a of the Horizon 2020 Model Grant Agreement

[2] <http://www.nsf.gov.cn/publish/portal1/>

## Societal Challenges

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Health, demographic change and wellbeing
<b>Call Title:</b>	Better Health and care, economic growth and sustainable health systems
<b>Call Identifier:</b>	h2020-sc1-bhc-2018-2020
<b>Topic Title:</b>	Innovative actions for improving urban health and wellbeing - addressing environment, climate and socioeconomic factors
<b>Topic Identifier:</b>	SC1-BHC-29-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	24.09.2019, 07.04.2020 (two-stage)

### Participant Portal Weblink:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-bhc-29-2020>

**Specific Challenges:** The natural and built<sup>[1]</sup> environment as well as the social fabric are critical determinants of health and well-being. Three quarters of the European population now live in cities and urbanisation continues at high speed, driven by economic growth and employment opportunities. The related environmental changes e.g. pollution of air and water, transportation problems, reduced social cohesion and stress affect physical as well as mental health. Although health has improved in the EU over the last decades, large differences in health still exist between and within all countries in the EU. These differences are caused by many factors such as living conditions, health-related behaviour, education, occupation and income, health care. Some of these inequalities are widening<sup>[2]</sup>. As European cities are growing, they are increasingly taking action and introducing policies to become more sustainable and liveable, adapting to climate change, investing in a range of smart and innovative solutions such as clean and sustainable transport, higher energy efficiency and stronger social cohesion. Similar initiatives are underway e.g. in Canada, USA as well as in **Asia** and Africa which could provide valuable knowledge.

At EU level, the Urban Agenda for the EU<sup>[3]</sup> focuses on improving the life of their citizens for example through the development of digital solutions, reducing urban poverty and better integration of migrants and refugees. The headline targets in the EU2020 strategy aim to turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion<sup>[4]</sup>.

Improving urban health and reducing health disparities can be achieved by changes in individual behaviour as well as policies such as urban design and sustainable transport, (re)creating green and blue space or improved housing standards. There is a need to address public policies across sectors to achieve health benefits, systematically taking into account the health implications of decisions, to seek synergies, and avoid harmful health impacts (health in all policies<sup>[5]</sup>).

**Scope:** European research should engage to build the evidence base of effective policies, developing and testing new initiatives to improve urban health and environment in Europe. Given the variety of national experiences across European countries and regions, there is an important potential to learn from each other's practices and develop innovative actions for urban health.

Proposals should develop and test effective actions and/or policies for improved urban health and wellbeing in Europe. Where applicable, health inequalities and environmental aspects should be addressed. These actions or policies should also be assessed for cost-effectiveness as well as barriers and facilitators to implementation. Proposals should address improved physical or mental health, or both, while considering the relevant socio-economic and/or environmental determinants of health. They could address any sector (with priority on other sectors than health care) or policy area relevant to achieve a lasting health improvement. Proposals should include analysis of vulnerable groups and gender aspects and address any such inequities in the design of interventions. Research teams should bring in all appropriate scientific disciplines to design and test interventions. This includes social scientists not least for their role on behavioural aspects

In order to link research to practical needs and user demands, teams should include other relevant parties in urban health, building partnership with stakeholders such as policy makers, users, business, and local communities. Proposals should address the need for more systematic data collection on urban health across the EU, to allow better analysis and conclusions. This may include the linking up with relevant population based cohorts.

As urban health is of concern in many regions of the world, proposals should foresee the possibility to link up internationally with other relevant urban health initiatives. Proposals should include in their budgets funds for participation in at least one international meeting gathering urban health initiatives relevant to the research.

The Commission considers that a proposal requesting an EU contribution between EUR 4 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:**

- More robust evidence for policy making on improved urban health in the EU
- Improved population health, physical and/or mental, in urban areas of the EU
- Reduced health inequalities in urban areas

**Cross-cutting Priorities:** Gender, Open Innovation, Socio-economic science and humanities

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- [1] Man-made structures, features, and facilities viewed collectively as an environment in which people live and work ([https://en.oxforddictionaries.com/definition/built\\_environment](https://en.oxforddictionaries.com/definition/built_environment))
- [2] <http://www.health-inequalities.eu/about-hi/health-inequalities-in-the-eu>
- [3] <https://ec.europa.eu/futurium/en/urban-agenda>
- [4] <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>
- [5] [http://www.who.int/healthpromotion/conferences/8gchp/statement\\_2013/en](http://www.who.int/healthpromotion/conferences/8gchp/statement_2013/en)

**Horizon 2020 Pillar:** Societal Challenges

**Programme:** Health, demographic change and wellbeing

**Call Title:** Better Health and care, economic growth and sustainable health systems

**Call Identifier:** h2020-sc1-bhc-2018-2020

**Topic Title:** **Global Alliance for Chronic Diseases (GACD)** - Prevention and/or early diagnosis of cancer

**Topic Identifier:** SC1-BHC-17-2020

**Type of Action:** RIA Research and Innovation action

**Deadline(s):** 07.04.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-bhc-17-2020>

**Specific Challenges:** The **Global Alliance for Chronic Diseases**<sup>[1]</sup> (GACD) call will focus on implementation research proposals for the prevention<sup>[2]</sup> and/or early diagnosis of cancer in Low and Middle-Income Countries (LMIC) and/or in vulnerable populations<sup>[3]</sup> in High- Income Countries (HIC)<sup>[4]</sup>.

The world is facing a critical healthcare problem due to ageing societies, unhealthy lifestyles, socio-economic inequalities, and a growing world population. Cancer is becoming one of the most important public health problems worldwide. In 2018, it is estimated that 181 million<sup>[5]</sup> people have been diagnosed with cancer and 9.6 million have died from it. Predictions suggest that 30 million people will die from cancer each year by 2030, of which three-quarters in low- and middle-income countries (LMICs).

With an estimated 30-50% of avoidable cancers, it is a leading cause of premature death, reducing a country's productivity. Current cancer prevention and control do not fully reflect ethnic, cultural, environmental, socio-economic and resource differences. In particular, limited implementation research is conducted on cancers primarily found in LMICs and vulnerable populations in HIC. In order to achieve the United Nations' sustainable development goal 3.4<sup>[6]</sup>, implementation research and healthcare efforts are needed to prevent and control cancers in these countries and populations.

**Scope:** Proposals should focus on implementation research for the prevention and/or early diagnosis of cancer on in LMIC and/or in vulnerable populations in HIC. Proposals should build on interventions with promising or proven effectiveness (including cost-effectiveness) for the respective population groups under defined

contextual circumstances. For promising interventions, a limited validation period can be envisaged. However, the core of the research activities should focus on their implementation in real-life settings. The proposed interventions should be gender-responsive.

The aim should be to adapt and/or upscale the implementation of these intervention(s) in accessible, affordable and equitable ways in order to improve the prevention and early diagnosis of cancer in real-life settings. Interventions should meet conditions and requirements of the local health and social system context and address any other contextual factors identified as possible barriers.

Each proposal should:

Focus on implementation research addressing prevention, and/or early identification strategies derived from existing knowledge about effective and/or promising interventions.

For screening interventions, the pathway to referral for positive cases should be included.

Include a strategy to test the proposed model of intervention and to address the socioeconomic and contextual factors of relevance to the targeted region and community.

Lead to better understanding of key barriers and facilitators at local, national and international level that affect the prevention and/or early diagnosis of cancer.

Include health economics assessments as an integral part of the proposed research, including considerations of scalability and equity.

Propose a pathway to embed the intervention into local, regional or national health policy and practice, addressing:

A strategy to include policy makers and local authorities (possibly by being part of the consortium), as well as other relevant stakeholders such as community groups, patient groups, formal and informal carers and any other group, wherever relevant from the beginning of the project, which will contribute to the sustainability of the intervention, after the end of project.

Relevance of project outcomes/evidence for scaling up the intervention at local, national and international level and then scaled-up appropriateness with respect to the local social, cultural and economic context.

Research under GACD involves regular exchange of research findings and information across participating projects by means of cross-project working groups and annual joint meetings. Wherever feasible, projects should harmonise and standardise their data collection and exchange data. Applicants must budget for annual costs of having two team members participate in one annual face-to-face meeting of the Annual Scientific Meeting (location to vary annually). Applicants must budget their involvement in GACD working groups and other GACD wide activities, beyond their projects.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 3 million would allow this specific challenge to be addressed

appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** The proposals should address one of or combinations of:

- Advance local, regional or national cancer prevention and/or early diagnostic health policies, alleviating the global burden of cancer;
- Establish the contextual effectiveness of cancer intervention(s), including at health systems level;
- Improve tailored and affordable prevention and/or early diagnosis;
- Provide evidence and recommendations to national programmes and policies focusing on prevention, screening, and/or early diagnosis;
- Inform health service providers, policy and decision makers on effective scaling up of cancer interventions at local, regional, and national levels, including affordability aspects for users and health providers;
- Reduce health inequalities and inequities, including due consideration of socio-economic, gender and age issues where relevant, in the prevention and/or early diagnosis of cancer at both local and global levels;
- Provide pathway to cancer care for the patients diagnosed with cancer;
- Maximise the use of existing relevant programmes and platforms (e.g. research, data, and delivery platforms);
- Contribute to the United Nations' Sustainable Development Goal 3.4.

**Cross-cutting Priorities:** International cooperation, Socio-economic science and humanities

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[1] <http://www.gacd.org/>

[2] Tertiary prevention is excluded from the topic.

[3] Proposals should demonstrate the vulnerability of the targeted population in HIC.

[4] <https://databank.worldbank.org/data/download/site-content/CLASS.xls>

[5] GLOBOCAN and CONCORD-3

[6] <https://www.un.org/sustainabledevelopment/health/>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Health, demographic change and wellbeing
<b>Call Title:</b>	Better Health and care, economic growth and sustainable health systems
<b>Call Identifier:</b>	h2020-sc1-bhc-2018-2020
<b>Topic Title:</b>	Actions in support of the International Consortium for Personalised Medicine
<b>Topic Identifier:</b>	SC1-HCO-01-2018-2019-2020
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	07.04.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sc1-hco-01-2018-2019-2020>

**Specific Challenges:** Personalised Medicine is a very broad and multifaceted area where success relies on a well-functioning collaboration between several disciplines and different actors. While great advances have been made in some fields of medicine, in particular in stratification of cancer patients and in addressing rare diseases, most of today's healthcare protocols do not include personalised approaches apart from occasional division into broad age groups (children/adults/elderly), sex or ethnicity. Furthermore the prevention aspect of personalised medicine, i.e. identifying individuals prone to develop certain diseases, is largely isolated from treatment options. As is the case for a relatively nascent field there is a need for standardisation of approaches, including for sampling, data storage, interpretation and data exchange and also for clinical trials design and reimbursement models. European countries with their social model of healthcare along with (in several cases) centralised cost reimbursement, are ideally placed to lead the way for an integrated health management system. Many needs for coordination and support activities have been identified by ICPeMed<sup>[1]</sup>, an EU Member States led initiative which includes representatives from most EU countries along with several other European countries, Brazil and Canada. The EC currently supports ICPeMed with a grant to operate its secretariat until October 2020<sup>[2]</sup>. Wider internationalisation of ICPeMed can be underpinned by coordinating networking activities with **third countries**.

**Scope:** Each action should focus on one of the following fields:

- **International aspect:** The action should focus on building links with **third countries** by analysing the potential and advantages of collaboration in personalised medicine (PM) with those countries, studying areas of interest for Europe in PM collaboration and promoting international standards in the field. In particular the uptake of personalised approaches in health systems and healthcare should be addressed, taking into account social, cultural, ethical and legal aspects, health economy issues and equitable healthcare. For the 2018 call, the project should focus on CELAC<sup>[3]</sup> as a group of countries, and for the 2019 call on **China**. For the 2020 call, the project should focus on countries in Africa<sup>[4]</sup>, linking also into the EU-AU (African Union) policy dialogue and taking into account the new Africa-Europa Alliance for Sustainable investment and Jobs<sup>[5]</sup>. Alignment with activities of the **Global Alliance for Chronic Diseases** (GACD) and The European and Developing Countries Clinical Trials Partnership (EDCTP) activities should be explored. Special attention should be given to prediction and prevention, and to promoting well-being for all at all ages. Furthermore, the project should seek to integrate local knowledge and practice. Data safety and privacy should be addressed in line with existing standards and legislation. The project should have a duration of at least four years and address sustainability beyond that to ensure longer term structuring effect. 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 at least one participant based in the international partner region; Africa (2020 call).
- **Regional aspect:** The action should establish and support networking between regions and interregional cooperation in different European countries, in particular linking remote or sparsely populated regions with regions harbouring critical mass of medical and PM expertise while taking into account broader socio-economic and cultural aspects. The focus of the action can include aspects of genomic analysis, me-Health (mobile and electronic Health), telemedicine etc. but should aim at structuring PM application at regional level. Linkage to existing inter-regional projects (financed by INTERREG programmes) or interregional partnerships of Thematic Smart Specialisation Platforms will be actively encouraged. (2018 call).
- **Healthcare- and pharma-economic models for personalised medicine,** interlinking European public health approaches with medical practice and financing. The action should carry out studies in support of research in and development of new health- and pharma economic models for PM, including prevention, to capture value and to develop relevant health financing models. Analysing mid- and long-term impacts of innovative products designated for sub-sets of patient populations on the patients themselves and on public health systems. Assessing the benefits of personalised medicine development for citizens and their broader social environment while ensuring patient safety, access, equity, solidarity, data safety and financial sustainability of public health systems in the EU. The action should involve different relevant stakeholders and take into account work being carried out by other EU funded initiatives, such as EUnetHTA<sup>[6]</sup>. SME participation is encouraged. Results of the studies and workshops should be actively disseminated to a wider

audience, including relevant authorities, professionals and the wider public. (2018 call).

- Standardisation for clinical study design. Establishment of innovative clinical trial design methodology for PM, including guidelines for research and reflection papers. The action should take into account sex/gender differences as well as the work done by relevant stakeholders and authorities such as EMA<sup>[7]</sup> and the HMA network<sup>[8]</sup>, as well as the European legal framework<sup>[9]</sup>. SME participation is encouraged. The results of the studies and workshops should be actively disseminated to a wider audience, including, industry, researchers and other professionals. (2019 call).
- ICPeMed secretariat: The project should continue the work done by the secretariat for ICPeMed, e.g. maintenance of existing services, organising the meetings of the ICPeMed Executive Committee, convening dedicated workshops and preparing and issuing updates of the ICPeMed Action Plan. Furthermore maintaining the network of policy makers and funders gathered in ICPeMed and expanding the membership to new interested and complementary partners as well as maintaining communication with all EC funded activities related to ICPeMed (2020 call).

For grants awarded under this topic for Coordination and Support Actions it is expected that results could contribute to European or international standards. Therefore, the respective option of Article 28.2 of the Model Grant Agreement will be applied.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1.5 and 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Contributing to the implementation and reach of the ICPeMed initiative; furthermore:

- International aspect: Integrating the country/group of countries into ICPeMed activities. Support wider adoption of standards developed in Europe. Support the EU-AU policy dialogues relevant to research and health (2020 call). Contribute towards the UN Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Regional aspect: Strengthened links between European regions setting up or planning personalised medicine healthcare approaches. Aligning research funding with ongoing and foreseen investments e.g. from Structural Funds. Recommendations on best practice in implementing PM at regional level.
- Healthcare- and pharma-economic models: Increased understanding of personalised medicine perspectives on how to capture value, develop institutional support and design relevant payment models. Recommendations for faster translation from discovery to patients'/citizens' access. Contributing to understanding of trends and dynamics in the pharmaceutical markets in relation to increased emphasis of research and development efforts on PM. Suggestions on how savings through prevention can be included in payment and reward models and contribute to the sustainability of public health

systems in the EU. Improved knowledge and understanding among healthcare professionals and the wider public of potential benefits of PM approaches.

- Standardisation for clinical study design: Contribute to standardisation of PM clinical trial design. Demonstrate feasibility and importance of PM approaches. Underpin accelerated market uptake. Improved knowledge and understanding among healthcare professionals, regulatory authorities and industry how best to adapt clinical trials designs to stratified patient populations.
- ICPeMed secretariat (2020 Call): Ensure continuity of the operations of ICPeMed beyond 2020. Increase the visibility of the consortium and ensure openness of the structure. Provide harmonised vision for the further development of personalised medicine. Contribute to the convergence of members' approaches to personalised medicine and further alignment of research efforts in the field.

**Cross-cutting Priorities:** Gender, International cooperation, Socio-economic science and humanities

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[1] <http://icpermed.eu>

[2] H2020 Grant Agreement 731366

[3] Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Grenada, Guyana, Jamaica, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela

[4] African Union Member States

[5] <https://www.africa-eu-partnership.org/en/stay-informed/news/european-commission-unveils-new-africa-europe-alliance-sustainable-investment-and>

[6] European Network for Health Technology Assessment: <http://www.eunetha.eu/>

[7] European Medicines Agency: <https://www.ema.europa.eu>

[8] Heads of Medicines Agencies: <http://www.hma.eu/>

[9] Especially the clinical trials regulation (EU) No 536/2014 and the data protection regulation (EU) 2016/679

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Blue Growth
<b>Call Identifier:</b>	h2020-bg-2018-2020
<b>Topic Title:</b>	The Future of Seas and Oceans Flagship Initiative
<b>Topic Identifier:</b>	BG-07-2019-2020
<b>Type of Action:</b>	IA-LS Innovation action Lump Sum
<b>Deadline(s):</b>	22.01.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/bg-07-2019-2020>

**Specific Challenges:** Our future is intimately linked to the future of the seas, oceans and coasts. The seas, oceans and coasts provide multiple ecosystem services and a wealth of resources, influence climate and provide many economic opportunities. To fully profit from the seas and oceans also in the future, we have to preserve those valuable resources and ensure that their exploitation is sustainable. Furthermore, without appropriate ocean observations for forecasting and for the protection of property and human activities, the global economy would lose hundreds of billions of euros annually. For this, we need to have the technologies for observations, integrated ocean observing systems, data management systems, and appropriate models and services. This action will contribute to make ocean observations and data management in European seas and the Atlantic Ocean fit for the future, in line with the G7 Future of the Oceans Initiative (Tsukuba Communiqué of the G7 Science Ministers<sup>[1]</sup>). It will also support the Collaborative Research Action on Oceans of the **Belmont Forum**<sup>[2]</sup> and the International Ocean Governance Communication<sup>[3]</sup>. Similarly, ocean observation data must be available to effectively address local, national and global challenges such as the forecasting of ocean conditions and climate change, to take stock of biomass and biodiversity, to mitigate the impact of climate change and ocean acidification, to ensure food security and food safety (also in fresh water), and to contribute to the UN 2030 Sustainable Development Agenda, notably UN SDGs 2, 13, 14 and 15, and monitoring their targets for 2020 and 2025.

**Scope:** Proposals shall address the following sub-topic: technologies for observations (in 2020). Actions shall demonstrate integration, capacity and (scientific, economic

etc) potential. They shall complement and build on existing observation tools and systems such as EuroGOOS/EOOS, IOOS, GEO/GEOSS, COPERNICUS Marine Service or EMODnet, European research infrastructures such as Euro-Argo ERIC and EMSO ERIC as well as funded H2020 projects such as SeaDataCloud<sup>[5]</sup>. The interdisciplinary and cross-sectorial nature of the proposal should also apply to training activities improving the professional skills and competencies of workers and supporting the creation of new jobs in the blue economy.

#### [C] 2020 - Technologies for observations

Proposals shall address

- i) the demonstration of new and innovative technologies to measure the Essential Ocean Variables (EOV) at all depths, and
- ii) sensors to measure variables for aquaculture, fisheries, micro and nanoplastics, and marine litter and micro-litter,
- iii) the demonstration of novel approaches to observe the ocean with multiple underwater, surface, and air vehicles (surface and air vehicles are optional, but underwater must always be included) with a view to realizing the digital ocean. Optional air vehicles could potentially, among others, contribute to the development of fully documented fisheries.

Sensors should measure in-situ biogeochemical and biological EOVs and may include new or emerging EOVs (possibly defined at OceanObs19<sup>[20]</sup> or those needed for MSFD Descriptors) as well as technologies needed for “augmented” observatories (i.e. genome-enabled multidisciplinary observatories) to allow deeper investigation of marine biology and ecology and as sites to test the new technology. Demonstrations to advance deep sea oceanography, notably biological oceanography, by combinations of fleets of gliders, fixed stations, research vessels, etc. should reach TRL 6 or higher. Proposals may also cover the standards, protocols and communications needed for the observations, for open access to data, standards for data management and communication. Activities to transfer technologies from other sectors (for example combinations with data from satellites) will also be considered. The proposals shall also address issues such as low-power, miniaturisation, modularity, interoperability and low-cost. The proposals shall take agreed standards (for example Open Geospatial Consortium standards) into account. The development of new vehicles or other platforms are excluded from this call. Data collected (except data for testing) must be prepared in line with commonly agreed standards and be made available in a form suitable for EMODnet and clouds.

This topic is in support of the European Strategy for Plastics in a Circular Economy. Selected projects under this topic as well as projects selected under other topics in H2020 supporting the Plastics Strategy are strongly encouraged to participate in joint activities as appropriate. These joint activities could take the form of clustering of projects, participation in workshops, common exploitation and dissemination etc. The projects should describe how they will be complementary with already existing relevant national activities or other multilateral activities funded by the EU or funded jointly by several Member

States. The proposals are expected to demonstrate support to common coordination and dissemination activities. Therefore, the proposals should foresee a dedicated work package for this purpose and earmark appropriate resources. Further details of these coordination activities will be defined during the grant preparation phase with the Commission.

Please note that this topic is part of the lump sum funding pilot scheme. Funding for grants awarded under this topic will take the form of lump sums as defined in Commission Decision C(2017)7151 of 27 October 2017. Details of the lump sum funding pilot scheme are published on the Funding and Tender Portal together with the specific Model Grant Agreement for Lump Sums applicable.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 9 million for sub-topic [C] would allow this specific challenge to be adequately addressed. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

**Expected Impact:** Contributing to the ongoing implementation of the Galway and Belém Statements and of EU policies such as the EU Bioeconomy Strategy, the Circular Economy Strategy, the European Open Science Cloud Initiative, the Blue Growth Strategy, the Common Fisheries Policy, the EU Maritime Spatial Planning Directive, the Marine Strategy Framework Directive, the International Ocean Governance Communication and the UN Sustainable Development Goals, activities will:

In the short-term:

- Support the implementation of the G7 Future of the Seas and Oceans initiative, the Paris Climate Agreement, the UN Decade of Ocean Science for Sustainable Development, and the needs of the Marine Strategy Framework Directive.
- Achieve at least TRL 6 for ocean observations' systems and tools (sub-topic B and C).
- Contribute to regularly measure 50% of biological and biogeochemical EOVs, including in the sea below 2000 m, and predict negative impacts of ocean acidification and other selected stressors to take timely preventive measures, notably to protect aquaculture resources (sub-topic B and C).
- Lay the foundations for and contribute to the sustainable management and protection of marine and coastal ecosystems to avoid significant adverse impacts (UN SDG 14).

In the medium-term:

- Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health (UN SDG 14).
- Improve forecasting of climate changes, weather and ocean conditions to protect human activities, in support of UN SDG 14 and other relevant goals, and of the objectives of related conventions (for example on biodiversity).

- Shorten the time span between research and innovation and foster economic value in the blue economy.
- Improve the professional skills and competences of those working and being trained to work within the blue economy and in the context of open data sharing.
- Contribute to policymaking in research, innovation and technology.
- Increase data sharing and increase integration of data.
- Contribute to determining the distribution and fate of marine litter and microplastics (sub-topic C).

**Cross-cutting Priorities:** Blue Growth, Open Science, International cooperation, Socio-economic science and humanities

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[1] <http://www8.cao.go.jp/cstp/english/others/20160517communique.pdf>

[2] **Belmont Forum** <https://www.belmontforum.org/>

[3] (JOIN(2016) 49)

[5] This will also include mutual feedback processes with the Copernicus Programme and other relevant actions such as those undertaken by IOC/IODE or the Marine Environment Monitoring Service. See topic DT-SFS-27-2019 under this Work Programme's SC2 Sustainable Food Security Call. European Research and Innovation for Food and Nutrition Security, SWD(2016)319. <http://ec.europa.eu/transparency/regdoc/rep/10102/2016/EN/SWD-2016-319-F1-EN-MAIN.PDF>

[20] <https://www.oceanobs19.net/>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Biodiversity in action: across farmland and the value chain
<b>Topic Identifier:</b>	SFS-01-2018-2019-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-01-2018-2019-2020>

**Specific Challenges:** Agricultural biodiversity is understood to comprise all components of biological diversity that

- (i) are of relevance for food and agriculture and all components of biological diversity that
- (ii) constitute agro-ecosystems.

It is the result of highly dynamic interactions between the environment, genetic resources, agricultural practices and historical land management. The various dimensions of agricultural biodiversity play a significant role in conferring stability, resilience and adaptability to farming systems. Below ground biodiversity for example plays a major role in soil nutrient and water cycling, nutrient uptake by plants and in the control of plant diseases. Genetic diversity within species is at the origin of plant development, adaptation to different environments (including climate) and a wide range of properties which cater for diverse needs. The native biodiversity on and around farms is associated with the provision of important ecosystem services beyond farm level.

The way farmers manage their land has immediate effects on domesticated and native biodiversity. Specialised, intensive agriculture has generally resulted in higher productivity at the expense of decreasing levels of biodiversity, partly due to a lack of incentives for farmers to safeguard biodiversity. Ambitions to make diversity a more integral part of farming are reflected in a number of European policies and global commitments<sup>[1]</sup>. Translating these ambitions into practice will require the necessary know-how and a range of options for optimising the joint delivery of economic, environmental and social services by farming.

**Scope:** Activities will tackle biodiversity from various angles ranging from its supporting functions in agro-ecosystems (e.g. through activities of plant and soil biota), the integration of diversity into farming practices and incentives for wider biodiversity management including native biodiversity. Proposals will consider various temporal and spatial scales when assessing the dynamics of biodiversity and its relationship with farming systems, the surrounding landscapes and throughout value chains.

C. [2020] From agrobiodiversity to dynamic value chains (RIA)

Activities shall release the value of so far underutilised and often genetically diverse crops<sup>[6]</sup>, (including landraces and varieties) and promote their broader use in breeding, farming and in food/non-food value chains. They will improve the performance of the selected crop(s) in relation to specific characteristics (e.g. agronomic such as adaptability to climate related abiotic stresses or quality related traits) and address the corresponding needs for farm and land management. Activities will feed into the development of value chains, which provide opportunities to diversify farm activities and income as well as meet consumer demands for diversified products and/or for products with a local/regional identity. This will include developing and testing marketing channels with enhanced producer-consumer links.

Proposed work should fall under the concept of 'multi-actor approach', thus allowing for adequate involvement of the farming sector and other relevant stakeholders. Consortia shall build on interdisciplinary expertise and a balanced partnership reflecting a range of geographic and socio-economic conditions.

The Commission considers that proposals requesting a contribution from the EU of up to 6 million for C would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Proposals should include a task to cluster with other projects financed under the same sub-topic.

**Expected Impact:** Funded activities will showcase the benefits of agrobiodiversity at various levels and develop solutions and approaches to embed these benefits more effectively into farming and breeding practices.

In the short- to medium term work will

- expand the knowledge base on the links between biodiversity and agriculture and the use of agrobiodiversity in the context of sustainable farming and breeding practices
- result in improved methods for assessing and evaluating different levels of diversity (genetic, species and ecosystem) as well as the linkages between agrobiodiversity and ecosystems services
- develop strategies for an increased and more effective use of genetic diversity in breeding and farming, in particular to introduce adaptive as well as quality and health related traits (scope C)
- create specific avenues for products, farm income and value chains from underutilised crops (scope C)

- strengthen producer – consumer links amongst others through new marketing modes (scope C)

In the longer term, funded activities will help to foster the synergies between agricultural production, biodiversity (including genetic diversity) and the delivery of ecosystem services of local, regional and global relevance. They will allow the farming sector to continue fulfilling its multiple functions under predicted, more challenging biotic and abiotic conditions.

### Call information:

#### TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

#### For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** RRI, Socio-economic science and humanities

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[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement[1] See e.g. Common Agricultural Policy, EU Biodiversity Strategy, Convention on Biological Diversity, Sustainable Development Goals and COP 21 Paris Agreement

[6] No definition is proposed. Applicants are expected to explain and justify the choice of crops (including tree and other perennial crops) in relation to the proposal's and topic's ambition.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Healthy terrestrial livestock microbial ecosystems for sustainable production
<b>Topic Identifier:</b>	SFS-02-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-02-2020>

**Specific Challenges:** Research is increasingly paying attention to the importance of interactions between the animal host and microbiota and their effects on the production efficiency, and the health and welfare of animals. These interactions are highly dynamic and influenced not only by genetics, but also by external factors such as environment, nutrition/feeding and management. Recent developments in omics science and technologies have opened new avenues for understanding not only the biology and genetics of animals, but also the ecosystems in which they function and those which they harbour, i.e. microbiomes. This is particularly relevant for micro-organisms that are currently non-culturable. Research on the interplay between the animals and their microbial ecosystems is needed to contribute to the improvement of sustainable livestock production.

**Scope:** Activities shall address relevant microbial ecosystems of terrestrial livestock, and their effects on the production, health and welfare of animals. They should look in a balanced way at the characterisation of microbial ecosystems (including microbial communities and microbe-derived metabolites), assessing variability within and between breeds in relation to variability of production systems and diet; at microbial behaviour (e.g. interactions between microbiota, evolution with age of animals, transmission); at microbial functions and interactions with host, environment and management practices, including feeding where relevant; and at possible ways in which those ecosystems can be managed, including socio-economic aspects, in order to reduce environmental impact, improve production and its quality, and/or health in particular during challenging periods

such as early life, weaning or after disturbances. Activities will include the incorporation of data on microbial ecosystems in the models used to analyse phenotypic variability and to perform genetic evaluations. The activities shall address either ruminants, or monogastrics. Gut microbiome of pigs or poultry can be addressed only in so far as the activities are complementary to those in related projects selected under LC-SFS-03-2018. Proposals may cover one or more species and one or more microbial ecosystem.

Research on anti-microbial resistance can be included as long as it is not the main objective of the project (see topic SFS-12-2018/2019). Research on single animal pathogens is not the focus of the topic. The projects are encouraged to interact as appropriate with relevant collaborative projects in Europe as appropriate and with international initiatives such as the rumen microbial genomics network of the **Global Research Alliance on Agricultural Greenhouse Gases**<sup>[1]</sup>.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Funding will allow support for at least one project relating to ruminants and one to monogastrics.

**Expected Impact:** Funded activities will contribute to deciphering the characteristics and functions of the livestock microbial ecosystems and understand the ways in which they influence production, health and/or welfare of animals. They will provide standardised methodologies for further application in livestock production to the greatest extent possible, including socio-economic aspects.

In the short- to medium term, the application of the knowledge and solutions developed will, as appropriate:

- enable inclusion of data on microbial ecosystems in the models used to analyse phenotypic variability and to perform genetic evaluations;
- improve resource use and environmental impact of terrestrial livestock production;
- improve robustness and health of terrestrial livestock, in relation to productive functions;
- reinforce collaborations with initiatives in related domains to promote coherence and applicability of research on microbial ecosystems.

In the longer term, the funded activities will contribute to more resilient production systems.

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Delegation Exception Footnote:** This topic is part of a microbiome cluster. For complementary activities see also SC2 topics SFS-01-2018/19/20, SFS-03-2018 and BG-06-2018 on Marine Microbiomes as SC1 topic SC1-BHC-03-2018

**Cross-cutting Priorities:** International cooperation

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<sup>[1]</sup> <https://globalresearchalliance.org/research/livestock/networks/rumen-microbial-genomics-network>

**Horizon 2020 Pillar:** Societal Challenges

**Programme:** Food security, sustainable agriculture and forestry, marine and maritime and inland water research

**Call Title:** Sustainable Food Security

**Call Identifier:** h2020-sfs-2018-2020

**Topic Title:** Integrated health approaches and alternatives to pesticide use

**Topic Identifier:** SFS-04-2019-2020

**Type of Action:** IA Innovation action

**Deadline(s):** 22.01.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-04-2019-2020>

**Specific Challenges:** Plant protection and biocidal products (both covered under the term "pesticides") are used in agriculture to secure yield and ensure food and feed safety across agricultural production and the agri-food chain. At the same time, pesticides may have effects on the environment, non-target organisms, animal and human health. In the EU they are regulated<sup>[1]</sup> and assessed for pre-market approval but tools and methods need to be further developed to better understand the overall risks and impacts associated with their individual and combined use and possible side effects. Member States and EU policies seek to reduce reliance on pesticides by designing and implementing more integrated approaches to the use of pesticides while at the same time safeguarding competitiveness.

**Scope:**

B. [2020] Alternative to contentious pesticides (IA)

Activities will foster the development and testing of tools, approaches, strategies and/or products to reduce the risks associated with the use of contentious plant protection products and/or biocidal products in conventional and/or organic farming systems and/or the agri-food chain. They will seek for more sustainable alternatives to contentious (or, as appropriate, active substances used in) plant protection product(s) for integrated pest, disease and/or weed management in agriculture and/or biocidal product(s) for preventing and controlling harmful organisms occurring in facilities related to agricultural production and the agri-food chain. Activities should address the development, testing and demonstration of novel, more durable and sustainable approaches, products,

strategies and/or tools for their application within a systems approach and cultural practices.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 15 million for scope A and EUR 5 million for scope B would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

All sub-topics (A), (B): Projects should fall under the concept of the 'multi-actor approach'<sup>[2]</sup> including a range of actors to ensure that knowledge and needs from various sectors such as research, farming, advisory services and industry including SMEs are brought together. They should also seek contributions from social and economic sciences to cover the broader economic, social, behavioural and environmental issues associated with the adoption of novel management strategies, including the impact on labour, safety culture and risk management on farms and economic impact for farmers. This will include looking at gender aspects, as appropriate.

**Expected Impact:** Activities will contribute to a better understanding of complex, interlinked issues and reduce the reliance on the use of pesticides by helping to:

- establish the impacts of the use or non-use of pesticides on the environment and human health (consumers, operators, farm workers and residents in agricultural areas);
- improve farmer, consumer and citizen awareness of and trust in global health approaches through clear and transparent and integrated assessments, pest / disease / weed prevention and control strategies for EU agricultural production and / or the agri-food chain and related communication;
- introduce alternative approaches, tools, strategies and/or products for prevention and control of pests/diseases/weeds with improved environmental performance (e.g. reduced effects on non-target organisms, natural resources and the environment) in the field of plant protection and/or use of biocides related to agricultural production and activities across the agri-food chain (scope B);
- assess the potential risks and benefits of the chosen alternatives in a coherent and consistent way in view of safety and sustainability (scope B);
- improve current agronomic, ecological and cultural practices to increase the resilience of agricultural production and/or the agri-food chain against biotic stresses (scope B);
- assess the economic, social and environmental impact of the alternative proposals for the farmers and/or consumers (scope B);
- support relevant EU plant health policies and/or European risk assessments in relation to EFSA and / or ECHA activities (scope B).

In the longer-term results will strengthen an integrated health approach and foster the sustainable use of pesticides thereby reducing the exposure of human and animals, terrestrial and aquatic ecosystems, drinking water and the food chain to pesticides.

**Call information:**

## TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** Socio-economic science and humanities, RRI, Gender

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[1] Regulations (EC) No 1107/2009 and (EU) No 528/2012

[2] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

**Horizon 2020 Pillar:** Societal Challenges

**Programme:** Food security, sustainable agriculture and forestry, marine and maritime and inland water research

**Call Title:** Sustainable Food Security

**Call Identifier:** h2020-sfs-2018-2020

**Topic Title:** New and emerging risks to plant health

**Topic Identifier:** SFS-05-2018-2019-2020

**Type of Action:** RIA Research and Innovation action

**Deadline(s):** 22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-05-2018-2019-2020>

**Specific Challenges:** Trade and the movement of goods and people have facilitated the introduction, spread and establishment of plant pests and diseases. While new pests and diseases are likely to arise, existing ones might become more severe because of intensification, climatic variations and changes in agricultural and forest management practices. They can have a significant impact on agricultural and forest productivity, environment and economics. Appropriate and rapid responses from decision-makers need to be based on scientific knowledge which addresses pest and disease management in a comprehensive manner.

**Scope:** Proposals will target one or more new or emerging plant pests (the term “pests” includes weeds) and/or diseases (regulated or non-regulated, introduced or native) that are causing, or likely to cause, significant (socio)economic and/or environmental losses to European agriculture and/or forestry. The choice of target pest and/or disease will 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. Proposals will increase knowledge of the biology, pathways of entry and spread of pest(s)/disease(s) and clarify the dependencies on abiotic factors. They will improve methods and strategies for early detection, prevention and control as well as enlarge the range of tools for integrated, sustainable and effective pest/disease management. International cooperation with countries affected or threatened by the same pest(s)/disease(s) is encouraged. Proposals should fall under the concept of the ‘multi-actor approach’<sup>[1]</sup> including a range of actors to ensure that knowledge and needs from various sectors such as

research, plant health services and the farming/forestry sector are brought together.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Activities will contribute to finding adequate responses to new and/or emerging plant pests/diseases. More specifically knowledge and solutions generated by these actions will contribute to:

- the understanding of drivers of plant pest/disease emergence including the influence of climate change;
- the development of efficient tools for the prevention, detection and control of pests/diseases;
- the development of environmentally sound and long-lasting solutions for effective pest/disease management in farming and forestry in line with the principles of Integrated Pest Management within a systems approach;
- the reduction of economic, social and/or environmental losses for Europe;
- support for relevant EU plant health data management and policies.

In the longer term, project outputs will help the agricultural/forestry sector to remain productive and contribute to sustainable agriculture and/or forest health.

#### **Call information:**

##### TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

##### For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** International cooperation, RRI

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[1] See definition of the 'multi-actor approach' in the introduction of this Work Programme part.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Stepping up integrated pest management
<b>Topic Identifier:</b>	SFS-06-2018-2020
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	22.01.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-06-2018-2020>

**Specific Challenges:** There is a need to develop and promote more cost-effective and sustainable Integrated Pest Management (IPM) options which are based on a holistic view of agro-ecosystems. IPM is part of EU legislation promoting the sustainable use of plant protection products (SUD<sup>[1]</sup>). The various IPM solutions being developed across Europe all differ depending on the crops, the available climate monitoring systems, the underlying knowledge of pest populations, on pedo-climatic conditions and on the agro-ecological environment. IPM decision support systems and models developed as part of national or regional research projects usually only deal with limited aspects of crop production and are validated in regional circumstances. As a consequence, it often remains unclear what the value of such a model/system may be in other parts of Europe and what the impact of climate change could be on the validity of the model. Sharing IPM decision supporting tools at European level therefore has great potential for synergies.

Furthermore, on-farm demonstration of novel IPM tools would boost peer-to-peer learning across Europe and help farmers with daily management practices. The challenge is incorporating IPM into the entire farming system, and searching for synergies that result from taking a holistic approach in shaping farming systems.

**Scope:**

B. [2020] European-wide demonstration farm network (CSA)

Activities shall fuel a European-wide network of IPM demonstration farms, which make a direct link between research and practical farm management, thereby facilitating IPM uptake and knowledge-sharing among advisors and farmers. The

network should consist of normal farms where farmers can learn in a peer-to-peer mode from their colleagues. Practical information on the farm techniques should be made readily available to all, using open source and open data management to enable wide and long-term sharing, possibly according to specific typologies and areas. Links with administrative databases (e.g. IACS-LPIS system in Member States) and other data sources (e.g. Copernicus earth observations) should be explored. The project should in particular incentivise the uptake of IPM practices by advisors who are using a holistic farm approach. Organic farming practices could also provide a possible source of inspiration, and forestry may be included. Besides making use of the developed decision support tools under scope A and other monitoring and warning systems, the proposals should also help promoting the variety of other existing IPM practices, comparing emerging new IPM techniques, and covering various diagnostic tools and efficient pest monitoring methods. Organic farming practices may provide a possible source of inspiration, and forestry may be included. Proposals will support the development and European-wide sharing of training modules for farmers and for advisors, including from various national/regional sources and demonstration farm programmes. These training modules should feed into the national Agricultural Knowledge and Innovation Systems (AKIS)<sup>[3]</sup>. Projects shall seek synergies with the national or regional EIP networks and EIP Operational Groups, and provide input to and coordinate their strategy with the SCAR-AKIS Strategic Working Group. Proposals may include other IPM issues covered under the SUD such as application equipment, risk communication to society, etc. All collected knowledge should feed into the existing dissemination channels most consulted by farmers. As many “practice abstracts” prepared in the common EIP-AGRI format should be delivered as possible, including audio-visual material wherever possible. It is strongly recommended to cover as many Member States and regions as possible and to seek synergies with similar activities financed through other sources, e.g. the Common Agricultural Policy. Forestry may also be included. Proposals should fall under the concept of the 'multi-actor approach'<sup>[4]</sup>, with a consortium based on a balanced mix of actors with complementary knowledge, including participation and activation of farmers, farmers' groups and advisors to create co-ownership. In this way, in the long run, results will contribute to more sustainable agriculture by reducing exposure to pesticides of humans and animals, terrestrial and aquatic ecosystems, drinking water and the food chain.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million for scope A and EUR 6 million for scope B would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Activities should create added value to existing projects by giving farmers throughout Europe a broader understanding of the existing knowledge on integrated pest management. This will support relevant plant health policies, more specifically the implementation of the SUD<sup>[5]</sup> by demonstrating that IPM strategies work in a "real world" application, and in particular by

- helping farmers to incorporate IPM solutions in existing agricultural systems, with a focus on taking into account costs and benefits and interactions / with other aspects of agricultural management, thereby building resilience;
- supporting European platforms (such as the one created under scope A) for sharing and further developing IPM decision support systems, covering the various bio-geographical areas of Europe;
- broadening and adding value to the partnerships between actors, which are developing cost-effective IPM decision support systems ready for practice;
- creating an open European network of IPM demonstration farms in all EU Member States/Associated Countries and regions, sharing data and information with a long term effect available to all, where farmers can learn in a peer-to-peer mode from their colleagues on normal farms;
- increasing awareness of the available IPM toolbox and extending the range of applications, including by incentivising the take up of IPM techniques and related advisory tools by holistic oriented advisors in their daily services;
- increasing on-farm use of IPM techniques
- developing European-wide IPM training for farmers and advisors, with modules adaptable to the regional/national contexts , the various farmers' profiles and advisory services.

#### Call information:

##### TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

##### For FAB **China**:

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#### Cross-cutting Priorities: RRI

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[1] Directive 2009/128/EC on the sustainable use of pesticides

[2] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

[4] See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

[5] Directive 2009/128/EC on the sustainable use of pesticides

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Epidemiology of non-EU-regulated contagious animal diseases: from integrated data collection to prioritisation
<b>Topic Identifier:</b>	SFS-10-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-10-2020>

**Specific Challenges:** The increasing demand for animal derived food and the mounting pressure on land and oceans is expected to push further intensification and expansion of animal production in certain regions of the world. Contagious livestock diseases impede the efficiency of animal production and lead to economic costs, poor animal welfare, and in the case of certain diseases, have an impact on trade, consumer confidence and public health. While the impact of epizootic diseases and some other regulated contagious diseases is relatively well known due to the regulatory framework, the situation with non-regulated contagious diseases is poorly known, even less for diseases with multiple pathogens (disease complexes). It is up to the private sector to deal with them. There is a need to determine the prevalence of production related diseases, the burden of these diseases and to set up a framework to facilitate monitoring of the situation and enable improvements in risk assessments and prioritisation of disease control measures throughout the animal production chain, for the producers and their organisations, the private stakeholders in the livestock sector (e.g. veterinarians, animal health industry, animal breeding industry, food industry) and the public stakeholders (e.g. risk managers, funders).

**Scope:** Activities will aim to harvest the knowledge inherently carried in existing data streams on contagious, non-EU-regulated, animal diseases, including diseases with multiple pathogens (disease complexes) and AMR. The proposals should address at least terrestrial livestock, while including marine and freshwater aquaculture whenever relevant, and should investigate the feasibility of addressing relevant wildlife. Data from different production systems should be

included. Activities will look for ways to validate, integrate and process these data, including modelling, possibly generating additional useful information inferred from existing data and identifying new data that could be integrated in data streams. They will focus on identifying and characterising relevant data on diseases (including animals, pathogen and environment, including genomic and metagenomic data), context and consequences (e.g. performance), the various components of data streams and will assess opportunities and barriers to utilising or sharing information across countries and stakeholders throughout Europe. This should improve risk identification and determination of the burden and cost of non-regulated contagious diseases and effectiveness and efficiency of control measures. Relevant geospatial information and data on animal welfare and genetics, in so far as they can be connected to animal diseases, can be included in the planned activities.

Work shall explore the potential of precision farming and “big” data, cloud-based integrated data collection for the detection of hitherto undetected relations between symptoms, diagnoses, treatments, risk factors, control measures and spread of diseases as well as their associated burden and economic costs. They should test the feasibility and potential benefits of an integrated approach to knowledge extraction and decision support based on a specific risk scenario for a disease. Decision-makers involved at different levels in the management of diseases should be considered (e.g. producers, private stakeholders supporting diseases control plans at a collective level, public sector). Possible integration with farm management and information systems and (automated) decision support systems, should be explored. Development or refinement of existing risk-based approaches and early warning systems should be explored. The project will provide a coherent blueprint and a framework for the necessary changes to allow improved data utilisation to protect animal health and welfare, human health and the food chain in Europe. Proposals should fall under the concept of 'multi-actor approach'<sup>[1]</sup>, involving representatives of producers, veterinarians and other professionals from animal production and the food chain, as appropriate, and decision-makers.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Strategic utilisation of existing and development of new data streams will:

- allow a clear view on occurrence and cost of disease and relation to welfare;
- enable timely and evidence-based decision-making by stakeholders in public and private sectors, and potentially by producers. It will enable a more focused targeting of resources for controlling diseases;
- provide a basis for potential rapid and early detection coupled with prediction of consequent losses,
- facilitate educational strategies for animal disease and animal welfare management; identify gaps in human capital knowledge.

**Call information:**

## TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:**      Blue Growth

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[1] See definition of the 'multi-actor approach' in the introduction of this Work Programme part

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Genome and epigenome enabled breeding in terrestrial livestock
<b>Topic Identifier:</b>	SFS-13-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-13-2020>

**Specific Challenges:** Genetics is currently one of the important levers for efficient livestock production, not only to increase performance and productivity, but also to ensure resilience and to reduce resource use and environmental impact, to ensure health and welfare of the animals, while maintaining or improving longevity of animals and product quality. Understanding of the biological mechanisms underpinning traits, including epigenetic responses to the environment and non-genetic inheritance, remains relatively limited and underexploited, notably when several complex traits need to be targeted simultaneously, while avoiding or reducing trade-offs. In addition, improving livestock breeding programmes in both cosmopolitan and local breeds requires an optimal level of genetic diversity that needs to be measured and exploited. There is a need also for new knowledge and tools to open up new prospects for the measurement, conservation and exploitation of genetic diversity in farm animal species, for optimal genetic diversity in farm animal breeding programmes in both cosmopolitan and local breeds and to inform and develop strategies to provide for cost-effective in vivo conservation of endangered genetic resources.

**Scope:** The selected projects will assist in the exploitation of existing knowledge on the genome sequence and its regulation and expression. They will do so by providing

- (i) analysis of the genome and the epigenome in relation to combinations of traits (including intermediate and/or indicators) important for efficient terrestrial livestock production and

- (ii) tools to improve breeding schemes, both for cosmopolitan and local breeds of terrestrial livestock, striving to ensure optimal genetic and epigenetic diversity, at least within breeds.

The projects will encompass development of methods, tools and models to assist both industry and policy makers as well as to respond to social challenges. Proposals should fall under the concept of 'multi-actor approach'<sup>[1]</sup>, involving representatives of breeders, biodiversity conservation and other relevant professionals from animal production, the food chain and decision-makers, as appropriate.

The activities may address:

- Study of the genetic relationship between animal performance traits to tackle some potential trade-offs between different phenotypes of interest that may alter long-term selection strategies to improve lifetime efficiency.
- Assessment of the relevance of
  - (i) epigenetic mechanisms as a potential source of phenotypic variance unaccounted by genomic selection, and
  - (ii) improving genomic prediction models with better integration of environmental and non-genetic inheritance factors.
- Development of
  - (i) appropriate deep phenotype indicators and their genomic and epigenomic determination that reflect different ways of improving resource-use efficiency, health, welfare, quality and resilience of terrestrial livestock and
  - (ii) multi-trait genomic and epigenomic prediction models that can efficiently utilize these indicators.
- Assessment of the potential, including benefits and risks, of both
  - (i) genome editing for cross-species and/or inter-breed transmission of specific traits without affecting other selected characteristics or specificities and
  - (ii) targeted epigenome editing for improved animal welfare and/or product quality.
- Study of the opportunity and feasibility of integration of genome editing in genomic selection (specifics and comparison with introgression: theoretical and practical applications).
- Development of refined genomic and epigenomic strategies for management of biodiversity.

The projects are encouraged to interact as appropriate with relevant Horizon 2020 projects.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Methods for biology-driven selection of livestock with more balanced performances for production, robustness, and/or quality, taking into account environmental variability.

Set of phenotypes as well as the molecular tools available to farmers and farm advisers to assess and simultaneously drive animal traits related to efficiency, for a long-time evaluation of breeding strategies.

Set of options for conservation of genetic diversity among and within breeds.

More generally, the projects will contribute to the diversity and sustainability of livestock production.

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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[1] See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Emerging challenges for soil management
<b>Topic Identifier:</b>	SFS-21-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-21-2020>

**Specific Challenges:** Sustainable soil management is paramount to keep soils in a good status for both agriculture and environmental needs. Over the past years, our understanding of the various threats to soil functions has increased. The recent, more in depth analysis of the importance of soil biodiversity for delivering important ecosystem services has identified major knowledge gaps on its role for the degradation of waste materials and for agricultural productivity. The extensive use of plastics, products containing plastic and other emerging contaminants in daily life has not only impacts on oceans but also on soils. The understanding of the impact and fate of micro- and nano-plastics and other stressors on soils is very limited and needs assessing. Following recent assessments of land degradation by IPBES and IPCC, there is also a need to evaluate the economic, social and environmental costs of soil and land degradation.

**Scope:** Proposals should address only one of the following sub-topics:

- A. [2020]: Emerging challenges for soil management: Soil biodiversity assessment (RIA)

Proposals shall cover soil biodiversity analysis, including relevant microbes and invertebrates for soil-mediated ecosystem services. Proposals shall address soil management, exploring the links between soil biodiversity, its functions and land degradation to increase economic, environmental and social wellbeing of biogeographical regions of Europe. Proposals shall cover ecosystem stressors on soil and more particularly on soil biodiversity and its potential impact on ecosystem functions.

Work shall build on the existing initiatives<sup>[1]</sup> and provide support to relevant Member State commitments under the Global Soil Partnership. If relevant cooperation and complementarities could also be sought with projects funded by other Societal Challenges<sup>[2]</sup>. International cooperation is encouraged.

B. [2020]: Emerging challenges for soil management: use of plastic in agriculture (RIA)

Proposals shall cover analysis of the use of plastic in agricultural production and its impact on soil. The particular focus of the proposals should be on the micro-plastic after harvest and its fate in the environment. The potential future impact of micro-plastic on soil biodiversity and its potential transfer to other parts of the environment and beyond should be analysed.

Activities shall also analyse the impact of micro- and nano-plastics on soil properties and its ecosystem services function. In addition the focus of this analysis should be concentrated on the use of plastic during agricultural production at the field level but also at the farm level. Proposals should fall under the concept of the 'multi-actor approach'<sup>[3]</sup>

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:**

- Understand the current status, challenges and potential of soil biodiversity (sub-scope A);
- Understand the impact of micro- and nano-plastics on soil biodiversity and ecosystem services (sub-scope B);
- Understand the impact of micro- and nano-plastics and other stressors in soil on agricultural productivity and ecosystem services (sub-scope B);
- Understand and assess the chemical changes and disaggregation of micro- and nano-plastics in soils, their impacts and further behaviour in soils (including soil physics) (sub-scope B);
- Quantify the economic, environmental and social consequences of unsustainable soil management in different biogeographical regions (sub-scopes A and B);
- Contribute towards understanding, management and conservation of soil biodiversity for the global soil assessment (sub-scope A);

In the long term, funded activities will contribute to European and international soil biodiversity assessments such as initiatives under the Food and Agricultural Organization of the United Nations.

**Call information:****TARGETED INTERNATIONAL COOPERATION**

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

**For FAB China:**

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**Cross-cutting Priorities:** International cooperation

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- [1] European Soil Biodiversity Atlas prepared by of the European Commission's Joint Research Centre and the Global Soil Biodiversity Atlas prepared by the European Commission's Joint Research Centre and Global Soil Biodiversity Initiative.
  - [2] Societal Challenge 1 (Health, Demographic Change and Wellbeing), Societal Challenge 5 (Climate Action, Environment, Resource Efficiency and Raw Materials)
  - [3] See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Genetic resources and pre-breeding communities
<b>Topic Identifier:</b>	SFS-28-2018-2019-2020
<b>Type of Action:</b>	IA Innovation action
<b>Deadline(s):</b>	22.01.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-28-2018-2019-2020>

**Specific Challenges:** Genetic resources (GenRes) play a crucial role in agricultural activities and sustainable forest management in Europe. They hold the key to the adaptation of plants and animals to a changing and more variable climate, yet their diversity remains largely underused in current breeding, farming and forest management. Conservation efforts (in-situ, ex-situ) aim to capture, preserve, evaluate and make available a substantial share of these global assets. However, access to resources is often limited by the quality of the material and the information provided by the various conservation sites. With increasing concerns over biodiversity loss and genetic erosion, there is a need to step up collaborative efforts to expand and improve the preservation, evaluation and the use of plant and animal GenRes in farming and forestry.

**Scope:** A range of activities implemented by a wide range of stakeholders will seek to enhance management and use of GenRes and implement global commitments in this area. While the focus of activities is on Europe, international resources and activities shall be taken into account.

C. [2020]: The GenRes-user interface and pre-breeding activities (IA)

Activities will accelerate the mobilization of GenRes from in-situ and/or ex-situ collections to benefit plant breeding and the delivery of new varieties which are better adapted to variable environments and consumer demands. They will tackle the GenRes-user interface, i.e. propose improvements to the information available to users with regard to characteristics of accessions and also to the visualisation of this information. Major resources shall be devoted to pre-breeding activities implemented in close cooperation between public, private and non-for profit sectors. The involvement of SMEs is crucial and will be

fostered through targeted calls and financial support to third parties<sup>[1]</sup>. Due attention shall be given to pre-breeding activities undertaken across Europe and covering different pedo-climatic regions

The Commission considers that proposals requesting a contribution from the EU of up to EUR 3 million for sub-topic A, EUR 7 million for sub-topic B and EUR 7 million for sub-topic C would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Activities will enhance the status of genetic resources and increase effectiveness of conservation efforts, in particular in Europe.

In the short to medium term work will:

- improve tools to display user-friendly information on accessions and their characteristics (scope C)
- speed up the introduction of useful characteristics from GenRes into breeding (scope C)
- promote the delivery of new varieties which are fit for purpose as regards changing environmental / climatic conditions and consumer demands (scope C)

In the long term activities will allow tapping into the vast potential of GenRes more effectively in order to meet current and future needs of food security, the delivery of non-food products from primary production and support the different functions of forestry.

**Call information:**

**TARGETED INTERNATIONAL COOPERATION**

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

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**Cross-cutting Priorities:** Open Science, International cooperation

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[1] In line with Article 23(7) of the Rules for participation the amount referred to in the last paragraph of Article 204 of the Financial Regulation may be exceeded, where achieving the objectives of the action would otherwise be impossible or overly difficult.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Agri-Aqua Labs
<b>Topic Identifier:</b>	SFS-30-2018-2019-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-30-2018-2019-2020>

**Specific Challenges:** Agriculture and aquaculture are increasingly knowledge-intensive sectors that need to be supported by advances in basic science domains in tandem with translational research. This nexus between basic and applied research requires specific openings for testing ideas and their potential application in plant and animal production, both terrestrial and aquatic.

Recent developments in genomic selection have revolutionised animal breeding and resulted in significant gains in production efficiency of animals. However, our understanding of the biological mechanisms underpinning traits remains limited. Most phenotypes, in particular for traits related to health, biological efficiency and robustness, are complex and a major goal of biological research is to use genome information to predict such complex outcomes.

In the area of crop production, there is a fundamental interest in deciphering the dynamic responses of plants as they (pre)adapt to local conditions or adjust their growth and development to changes in the environment within their plasticity range. These adaptive traits are all the more important as plants are sessile and therefore require effective strategies to deal with uncertainty and to tolerate rather than avoid stress. Understanding the different adaptation strategies, and the circumstances that favour one strategy over another, is vital for understanding how annual or perennial crops perform in a given environment or under changing conditions. It will also help to assess how plants may respond to future environmental changes. Food and other plant-based products are the result of plants' capacity to harvest light and convert it into chemical energy to build energy rich organic compounds and ultimately biomass. Energy efficiency is central to plant yield and robustness. The various components of the complex

plant energy system as well as their interactions (in spatial and temporal terms) need to be better understood as a basis for crop improvement, crop management and adaptability of crops to changing environments.

**Scope:**

C. [2020]: Plant energy biology (RIA)

Proposals will advance our understanding of the plant energy system in terms of elucidating specific mechanisms as well as the complex processes and interactions that determine overall energy efficiency in plants.

More specifically work will allow to better understand and determine

- (some of) the various components, processes and interactions of plants' energy system and their regulation - from energy capture to its conversion, transport, photoassimilate partitioning and use
- the metabolic reactions underlying particular functions of plants' energy system
- responses of the energy system to abiotic changes (e.g. CO<sub>2</sub> concentration, light, temperature, water, salinity)
- the basis of naturally occurring variation of selected components of the energy system
- the overall energy efficiency in plants at various levels: cell – whole plant – canopy (including leaf anatomy and canopy structure)
- trade-offs between the efficiency of the energy system and the plant's susceptibility to or tolerance to biotic stresses

The above listed elements provide a framework for action from which proposals can choose a particular scope and approach in line with the broader objectives of the call.

While capitalising on knowledge resulting from work in model species, proposals should also work in crop species taking into account relevant agronomic conditions.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million for sub-topic C would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Results of funded activities will help to create knowledge hubs in their respective domains and develop specific pathways to feed biological insight into agricultural (husbandry, crops) and aquaculture practices.

In the short to medium term work will:

- allow to better understand the key mechanisms, interactions and control of the various components of plants' energy biology system as well as their inherent trade-offs at the subcellular and whole plant level (sub-topic C)
- help to better assess plant responses to abiotic changes (sub-topic C)
- elucidate energy related traits to feed into breeding and crop management strategies at the level of individual plants and the canopy (sub-topic C)

- advance knowledge on the relationship between photoassimilate partitioning, plant growth and agronomic yield (sub-topic C)

In the long term activities will enhance the sustainability of farmed animal production (sub-scope A). They will allow making more solid assertions on how crops will respond and can possibly better adapt to changing environments, also by means of enhancing plant energy efficiency to optimise productivity of plants.

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** Open Science, Blue Growth, International cooperation

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Sustainable Intensification in Africa
<b>Topic Identifier:</b>	SFS-35-2019-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-35-2019-2020>

**Specific Challenges:** African and European agriculture share the common challenge of moving towards more sustainable ways of agricultural production. Both regions aim to ensure food production and reduce the environmental impact of agricultural activities in the face of climate change, more unpredictable water supply and increased degradation of (land) resources. Systems approaches are needed to optimise agricultural productivity as well as the delivery of ecosystem services.

Environmental modifications such as climate change and globalisation are increasing the risk of infectious animal diseases emerging in new locations with greater frequency, and this is particularly relevant with vector borne diseases. These diseases have a major impact not only on livestock production and related economy but also on global food security and trade. Some of these emerging diseases also threaten human health (zoonoses). The African continent suffers from a number of vector-borne diseases, sometimes with heavy burden, although it is not always fully ascertained. A number of these diseases occur or do present a risk of introduction and spread also in Europe. The complex transmission cycles can make it difficult to assess risk and organise control. We need to get further knowledge on these diseases, not least on their vectors, in order to improve their control, and assess their potential spread all over Europe.

**Scope:**

C.[2020]: Vector-borne diseases in Africa (RIA)

The proposals should aim to develop knowledge on selected vector-borne diseases affecting terrestrial livestock, whether they also affect humans or

not. The proposals may address one or more diseases. Priority should be given to diseases with either a serious impact in Africa, or a risk of spread to Europe with significant consequences, or both. Activities should cover the ecology of the pathogens and vectors, and epidemiological features, including the risk of short and long distance transmission and the capacity for the disease to establish in and spread to new areas, with potentially features different from the original area. The burden of disease in animals (and humans if relevant), and the socio-economic impact should be further assessed as appropriate. Systems and/or networks to improve epidemiological surveillance strategies in domestic and wild species should be developed/strengthened. Activities should also address detection and control tools, including prevention, monitoring, diagnostics and:

- Vector competence studies including exploration of vector-pathogen interactions simulating field conditions.
- Map, explore and predict vector densities and spread and the role of the vector in spreading the disease.
- Study the relationship between immunity and pathogen spread including the role of pre-existing immunity and the role of vaccinations.
- Exploration of livestock species, both African and European breed, for susceptibility to the diseases.
- New diagnostic methods for pathogen or specific antibody detection.

Projects should include capacity-building and training activities. The projects should build on results and experiences from related EU projects and existing networks in this field.

Proposals should include a task to cluster with other projects financed under this scope and with the cooperation platform established under SFS-33-2018<sup>[4]</sup>.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7.5 million for sub-topic A, EUR 5 million for sub-topic B and up to EUR 6 million for sub-topic C would allow this specific challenge to be addressed properly. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

### **Expected Impact:**

In the short to medium term:

Funded activities will contribute to better prevention and minimisation and mitigation of selected vector-borne diseases of livestock (sub-topic C). More specifically they will:

- enable strengthened surveillance systems/networks and allow an improved view on occurrence and burden of selected disease(s);
- improve assessment of the risks of introduction and spread among livestock and humans of the selected disease(s) in new areas;
- provide improved tools for rapid detection of selected pathogens, preferably on-site;

- improve prevention and control of the selected disease(s);
- enable a more focused targeting of resources for controlling the selected disease(s);

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** Socio-economic science and humanities, International cooperation, Gender, RRI

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[4] The awarded project acronym is LEAP4FNSSA

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
<b>Call Title:</b>	Sustainable Food Security
<b>Call Identifier:</b>	h2020-sfs-2018-2020
<b>Topic Title:</b>	Healthy soils for healthy food production
<b>Topic Identifier:</b>	SFS-40-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	22.01.2020, 08.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/sfs-40-2020>

**Specific Challenges:** The EU and **China** are facing similar challenges of increasing soils health and producing more high quality food for increasing population. At the same time soils are facing a lot of pressures from use of fertilizers (manure and mineral), historical management of soils and increasing land degradation. To achieve certain quality of food production management of soils at the farm level needs to incorporate techniques for soil remediation/soil quality restoration and balanced fertilizer application. For the long-term increase of soil quality land management techniques should adopt and enhance quality of soils.

**Scope:** The proposals shall analyse soil remediation strategies and assess sustainable use of fertilizers for agricultural production including social-economic and environmental aspects. The evaluation of tools and methods for increasing the quality of soils and of food produced is included in the scope. Proposals shall also address land degradation aspects and prevention of further degradation. They shall cover the evaluation of agricultural systems (e.g. organic farming, agro-ecology, agroforestry) and their suitability to achieve a good status of soils for sustainable food production. The proposals shall build on the past projects financed under the EU-**China** cooperation on soil. The proposals will fall under the concept of 'multi-actor approach'<sup>[1]</sup>. Proposals shall promote balanced research and innovation cooperation between the EU and **China**. **China**-based entities that will participate in joint projects with European partners under Horizon 2020 have also the possibility to apply for funding under the **Chinese** co-funding mechanism.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million would allow this specific challenge to be addressed

appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Contributions for **Chinese** participants will come in addition and will be made available by **China**.

**Expected Impact:**

- Identification of tools and methods, mainly at the farm level for soil remediation and balanced fertilizers application;
- Identification of agricultural system approach that can enhance quality of soils for food production;
- To raise public awareness about soil as a crucial global resource;
- Enhance EU-**China** long-term cooperation in land use optimization for global food and environmental security.

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** International cooperation

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[1] See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Secure, clean and efficient energy
<b>Call Title:</b>	Competitive, low carbon and circular industries
<b>Call Identifier:</b>	h2020-low-carbon-circular-industries-2020
<b>Topic Title:</b>	Low carbon industrial production using CCUS
<b>Topic Identifier:</b>	LC-SC3-NZE-5-2020
<b>Type of Action:</b>	IA Innovation action
<b>Deadline(s):</b>	01.09.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-nze-5-2020>

**Specific Challenges:** CCUS in industrial applications faces significant challenges due to its high cost and the fierce international competition in the sectors concerned. However, these sectors currently account for 20% of global CO<sub>2</sub> emissions, and in the 2 degree scenario, should represent half of the stored CO<sub>2</sub> by 2050. Relevant sectors with high CO<sub>2</sub> emissions are for example steel, iron and cement making, oil refining, gas processing, hydrogen production, biofuel production and waste incineration plants.

**Scope:** Projects will focus on integrating CO<sub>2</sub> capture in industrial installations, whilst addressing the full CCUS chain. Projects will elaborate a detailed plan on how to use the results, i.e. the subsequent transport, utilisation and/or underground storage of the captured CO<sub>2</sub>. Important aspects to address are of technical (e.g. the optimised integration of capture plant with industrial processes; scalability; CO<sub>2</sub> purity), safety (e.g. during transportation and storage), financial (e.g. cost of capture; cost of integration) and strategic nature (e.g. business models; operation and logistics of industrial clusters and networks).

Projects are expected to bring technologies to TRL 6-7 (please see part G of the General Annexes). Technology development has to be balanced by an assessment of the societal readiness towards the proposed innovations. Relevant end users and societal stakeholders will be identified in the proposal, and their concerns and needs will be analysed during the project using appropriate techniques and methods from the social sciences and humanities, in order to create awareness, gain feedback on societal impact and advancing society's readiness for the proposed solutions. Projects should also explore the socio-economic and political barriers to acceptance and awareness with a view to regulatory or policy initiatives.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with relevant **Mission Innovation**<sup>[1]</sup> countries such as **China**<sup>[2]</sup>.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the Introduction of this part of the Work Programme.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** Successful, safe and economic demonstration of integrated-chain CCUS from relevant industrial sources such as mentioned in the specific challenge will accelerate the learning, drive down the cost and thus help break the link between economic growth and the demand for industrial output on one hand, and increasing CO<sub>2</sub> emissions on the other hand. The impact of projects under this call will to a large extent be determined by the extent to which the results will be exploited, i.e. the plan on how the captured CO<sub>2</sub> will be actually utilised and/or stored, either in the project or planned as a future phase. This will be evaluated based on the maturity and quality of the proposed post-capture solutions. Projects under this call that are carried out in areas where there is both a high concentration of CO<sub>2</sub> emitting industries and a nearby capacity for geological storage are considered prime sites for hub and cluster developments, and will generate the highest impact on full-scale deployment in the medium to longer term.

**Cross-cutting Priorities:** Socio-economic science and humanities

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[1] <http://mission-innovation.net/our-work/innovation-challenges>

[2] A Co-funding mechanism is in place in **China**; see <https://ec.europa.eu/programmes/horizon2020/en/news/eu-China-research-and-innovation-co-funding-mechanism-first-call-launched-China>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Secure, clean and efficient energy
<b>Call Title:</b>	Building a Low-Carbon, Climate Resilient Future: Secure, Clean and Efficient Energy
<b>Call Identifier:</b>	h2020-lc-sc3-2018-2019-2020
<b>Topic Title:</b>	International Cooperation with USA and/or <b>China</b> on alternative renewable fuels from sunlight for energy, transport and chemical storage
<b>Topic Identifier:</b>	LC-SC3-RES-3-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	01.09.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-sc3-res-3-2020>

**Specific Challenges:** Decarbonisation of the energy and transport systems requires the ultimate replacement of fossil fuels in the long-term and the flexibility to store sustainable energy on a large scale and for a long time in new kind of energy storage compounds. To achieve this goal, the production of clean forms of storable chemical energy carriers from direct sunlight will be necessary.

International collaboration is mutually beneficial in strategic areas where knowledge can be exchanged. The specific challenge is for Europe to precede together with its international partners in global development of specific disruptive technologies for the ultimate replacement of fossil fuels.

**Scope:** Proposals will aim at international cooperation with the USA and/or **China** on targeted research activities for obtaining advanced biofuels and alternative renewable fuels for energy and transport through photochemical/ photobiological or electrochemical reaction. The ranking of the successful proposals will ensure that a balanced portfolio of activities is covering both cooperation with USA and **China** (please see call conditions).

The proposals will develop breakthrough artificial photosynthesis technologies in terms of sunlight conversion efficiency for the production of energy carriers (other than electricity) with either de-novo synthetic biological and artificial/biochemical hybrid systems or novel photo-catalysis or photo-electro catalysis coupled with CO<sub>2</sub> reduction.

At least one of the following technology-specific challenges has to be addressed:

- Improved light-harvesting and efficient charge separation in photocatalytic systems;
- Photoelectrochemical cells – PECs and catalyst development
- Improved light harvesting coupled with improved CO<sub>2</sub> reduction efficiency in synthetic biological systems

Use of external renewable electricity or electricity generated by sunlight with PV or CSP to produce the carriers is excluded from this topic.

Proposals are expected to bring technologies to TRL 3-4 (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million would allow this challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** It is expected that the exchange of knowledge through the targeted research activities with USA and/or **China** will progress the scientific understanding and the technology state-of-the-art and in addition strengthen the European and international partners' technology base. At the same time, it is expected that the development of renewable fuels that outperform the best fossil fuel alternatives is accelerated.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), actions will contribute to implementing **Mission Innovation Challenge**<sup>[1]</sup> 4 and 5.

**Call information:**

TARGETED INTERNATIONAL COOPERATION

The following paragraphs are relevant for the entire 'Targeted international cooperation' section of the Work Programme, i.e. topics SFS-32-2018 to SFS-40-2020 inclusive.

For FAB **China**:

The European Commission and the **Chinese** Academy of Agricultural Sciences signed a letter of intent on research and innovation cooperation in food, agriculture and biotechnology (FAB) in November 2013. They agreed to work towards an ambitious strategic long-term partnership and launched the FAB 'flagship initiative'. Building on this agreement, the EU-**China** Task Force on FAB has developed specific common priorities that will promote substantial, coordinated and balanced research and innovation cooperation between the EU and **China**. These priorities are reflected in topics SFS-37-2019 to CE-SFS-39-2019.

**Cross-cutting Priorities:** Clean Energy, Socio-economic science and humanities, International cooperation

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[1] <http://mission-innovation.net/our-work/innovation-challenges/sustainable-biofuels-challenge/>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Smart, green and integrated transport
<b>Call Title:</b>	Building a low-carbon, climate resilient future: Green Vehicles
<b>Call Identifier:</b>	h2020-lc-gv-2018-2019-2020
<b>Topic Title:</b>	Setting up a common European research and innovation strategy for the future of road transport
<b>Topic Identifier:</b>	LC-GV-09-2020
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	21.04.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-gv-09-2020>

**Specific Challenges:** The objective of this topic is to define R&D roadmaps for a sustainable and efficient road transport system in Europe. It calls for a Coordination and Support Action to support ERTRAC (the European Technology Platform for Road Transport), future Partnerships relevant to road transport in Horizon Europe and the European Commission in defining the research needs for their upcoming research and innovation programmes, and by then helping to achieve the targets set at EU and global level (EU Transport White Paper, COP21 for decarbonisation, etc.).

International cooperation with developing and **Emerging Economies** should also be developed in order to increase efficient mobility for all, reduce local (air and noise) and CO2 emissions, and tackle health and safety issues, and increase attractiveness and competitiveness in particular in urban areas.

**Scope:** Proposals should take a comprehensive approach ranging from components up to system integration, and include enabling technologies where relevant. Both passenger mobility and freight transport should be addressed and covering urban mobility as well as inter-urban and long-distance transport. They should address all the following aspects:

- Updating of research agendas and roadmaps developed by the European Technology Platform ERTRAC (European Road Transport Research Advisory Council) and supporting the definition of research priorities of future Horizon Europe Partnerships relevant to road transport, covering all transport research fields.
- Facilitating cooperation between cities in Europe, **Asia**, Latin America and Africa. Actively support policy and knowledge exchange and establish a peer-

to-peer exchange and capacity building programme that takes advantage of the results of a large number of relevant cities. Cooperation between EU and international projects on urban mobility. Develop implementation concepts for sustainable mobility including shared private vehicles (e.g. light-duty vehicles and 2-, and 3-wheelers), logistics (e.g. e-Trucks, cargo bikes), public transport systems (e.g. Bus Rapid Transit Systems, buses, soft modes) and new mobility services.

- Liaise with international financing institutions to foster the take-up and implementation of the concepts developed, support the European Commission in international discussions and specialised sectorial Fora related to Mobility for All, Climate Change and the New Urban Agenda. Track global progress on urban electric mobility and support UN activities, such as the Urban Electric Mobility Initiative (UEMI).

The implementation requires close collaboration with the leading European stakeholders in transport research, including vehicles manufacturers, supply industry, and research and engineering organisations, as well as strong links with other relevant European initiatives and associations. In line with the strategy for EU international cooperation in research and innovation, international cooperation is encouraged with key **Emerging Countries**, in particular with **Asia**, Latin America and Africa.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.8 to 1 million each would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** This action will bring together the leading European stakeholders in road transport research to develop roadmaps and support international cooperation. It will contribute to a further harmonisation of research and innovation, and therefore contribute to the European Research Area, in particular also in the view of innovation, as well as to the European strategies for a future transport system.

Proposals are expected to contribute to:

- The objective of the European Union for climate action and sustainable development.
- The objectives set by the Paris Agreement (COP21) and the New Urban Agenda.
- The fulfilment of post 2020 emission targets in road transport (at least 30% by 2030 compared to 2021)
- The EU's long-term goal of moving close to zero fatalities and serious injuries by 2050 ("Vision Zero")
- UN's Sustainable Development Goals 11 "Sustainable cities and communities" (with particular attention to 11.2) and 13 "Climate Action"
- Strengthening the collaboration of the European Union with **Asia**, Latin America and Africa.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
<b>Call Identifier:</b>	h2020-lc-cla-2018-2019-2020
<b>Topic Title:</b>	Polar climate: understanding the polar processes in a global context in the Arctic and Antarctic Regions
<b>Topic Identifier:</b>	LC-CLA-17-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	13.02.2020, 03.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-17-2020>

**Specific Challenges:** Many of the natural physical processes occurring in the polar atmosphere and oceans are potentially of profound significance in controlling conditions across the globe and affecting lives and livelihoods across the world, in the Polar, sub-Polar, temperate, and tropical regions. Understanding the interacting nature and feedback of polar processes and addressing their consequences in a global context will benefit the people, policy and businesses well beyond the Polar Regions.

**Scope:** Proposals should aim at developing innovative approaches, building on existing data resources and infrastructures, the latest observational products (including in-situ observations), and state-of-the-art climate models, to assess the key physical and chemical processes in the ocean and atmosphere and the key ocean-atmosphere-ice interactions. Proposals should cooperate with relevant projects funded by the ESA Earth Observation Programme. In addition, they are encouraged to join the EU Arctic Cluster in order to build synergies and maximise the complementarity of the different actions in the Cluster. Proposals should build upon previous actions funded under Horizon 2020 and avoid duplication or overlap.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with countries – beyond the EU Member States and countries associated to Horizon 2020 – that took part in the Arctic Science Ministerial meetings of 28 September 2016 and 25-26 October 2018<sup>[1]</sup>.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 7-8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:**

The project results are expected to contribute to:

- improved understanding of how the changing polar climate systems affect and are affected by lower latitudes through ocean and atmospheric circulation;
- improved understanding of the key ocean-atmosphere-ice interactions;
- improved understanding of the fully coupled physical climate system (atmosphere-ocean-ice) on diverse space and time scales;
- improved understanding of the key physical and chemical processes in the ocean and in the atmosphere;
- improved projections of future polar and global climate, including feedbacks and impacts
- improved capability to respond to the impact of climatic change on the environment and human activities in the Polar Regions (with a focus on the Arctic), both in the short and longer term;
- the IPCC scientific assessments, the consolidation phase of the Year Of Polar Prediction (YOPP) and to the Copernicus Climate Change (C3S) services.
- supporting the assessment of regional climate impacts.

**Cross-cutting Priorities:** International cooperation, Blue Growth

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[1] i.e. the United States of America, Canada, the People's Republic of **China**, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see <https://www.arcticsscienceministerial.org/en>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
<b>Call Identifier:</b>	h2020-lc-cla-2018-2019-2020
<b>Topic Title:</b>	Supporting the implementation of GEOSS in the Arctic in collaboration with Copernicus
<b>Topic Identifier:</b>	LC-CLA-20-2020
<b>Type of Action:</b>	RIA Research and Innovation action
<b>Deadline(s):</b>	13.02.2020, 03.09.2020 (two-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-20-2020>

**Specific Challenges:** In order to gain more insight in the fast rate of climate, ecological and environmental change taking place in the Arctic and to facilitate well-informed decisions, there is a need to develop coordinated Earth observations and information services specifically targeting this region, also building on the essential contribution of indigenous knowledge and community-based monitoring systems. These observations and services need to be delivered in order to support a sustainable development in the Arctic, particularly for responding to the needs of the people who live there. Observations and services are also necessary to improve the monitoring and predicting capabilities on changes that may affect other parts of the planet, and in particular the Northern hemisphere. The challenge and suitable actions to alleviate adverse consequences were identified in the 2nd Arctic Science Ministerial Joint Statement of Ministers.<sup>[1]</sup>

**Scope:** The action should aim at:

- (i) advancing the operationalisation of an integrated pan-Arctic Observing System in preparation for a possible future ArcticGEOSS initiative;
- (ii) improving and extending the terrestrial, marine and cryospheric in-situ measurements and the community-based monitoring systems necessary for the monitoring of the Arctic;
- (iii) setting up pilot services and implementing the coordinated network of those services necessary for the adaptation to climate change in the region;

- (iv) contributing to the interoperability of Arctic Data systems; and
- (v) to make a positive contribution to national, regional and international decision-making processes and science strategies.

The action should help to build an Arctic “window”<sup>[2]</sup> of Copernicus by bringing together all Arctic relevant observations deriving from different Copernicus services and promoting access to relevant Copernicus datasets.

The action should coordinate with projects stemming from the NSFs Arctic portfolio, such as the "Navigating the New Arctic" programme, and other actions of the Transatlantic Ocean Research Alliance, by establishing joint operational activities, in order to support the mission and objectives of the international initiative on Arctic observations brought forward by the Sustaining Arctic Observing Networks (SAON).

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with the countries and Indigenous Peoples organisations participating in the 2nd Arctic Science Ministerial<sup>[3]</sup>.

The action should build on the outcomes of previous EU-funded projects in the framework of GEO and Copernicus, create synergies and avoiding un-necessary duplications also by joining the EU Arctic Research Cluster. Likewise, the action should cooperate with relevant projects funded by the ESA Earth Observation Programme. To this end, proposals should foresee a dedicated work package and /or task and earmark the appropriate resources accordingly.

The pilot services should fall into the scope of EuroGEOSS and follow the direction of the EuroGEOSS initiative. Data and services produced through the projects should be registered in the GEOSS Common Infrastructure (GCI).

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

#### **Expected Impact:**

The project results are expected to contribute to:

- the implementations the GEO-Cold Region Initiative with a specific emphasis on the Arctic, and the initiating of an ArcticGEOSS initiative;
- sound and effective decision-making by policy makers in the Arctic regions through the use of reliable and science-based Earth observation and information;
- supporting of the 2030 Agenda for Sustainable Development, the Paris Agreement and Sendai Framework for Disaster Risk Reduction 2015-2030;
- strengthening Earth observation capacity focused on the European region;
- delivering EuroGEOSS services for the Arctic;
- improved handling, archiving and interoperability of environmental data in polar regions;
- a coherent data management, through the use of GEOSS Data Management Principles and best practices (aligning with INSPIRE).

**Cross-cutting Priorities:** Blue Growth, International cooperation

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- [1] Joint Statement of Ministers, 2nd Arctic Science Ministerial, Berlin 2018, [https://www.arcticsscienceministerial.org/files/ASM2\\_Joint\\_Statement.pdf](https://www.arcticsscienceministerial.org/files/ASM2_Joint_Statement.pdf)
- [2] <https://www.copernicus.eu/en/copernicus-services-information-and-sentinel-products-arctic-region>
- [3] i.e. the United States of America, Canada, the People's Republic of **China**, Japan, the Russian Federation, South Korea, New Zealand, India, Singapore, and Greenland; see <https://www.arcticsscienceministerial.org/en>

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
<b>Call Identifier:</b>	h2020-lc-cla-2018-2019-2020
<b>Topic Title:</b>	Enhancing the <b>Belmont Forum</b> Collaborative Research Action on Climate, Environment and Health
<b>Topic Identifier:</b>	LC-CLA-22-2020
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	13.02.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-22-2020>

**Specific Challenges:** The EU is a major investor and player in both climate change and health research. The EU also supports global research and innovation collaboration, including that done by the **Belmont Forum** - a partnership of funding organisations, international science councils, and consortia committed to the advancement of interdisciplinary and transdisciplinary science. Bringing together climate change and health research has been a particular challenge in Europe that requires coordination and support. Previous similar actions proved to be instrumental in providing the necessary support and the high degree of coordination within the European landscape and beyond.

**Scope:** Actions should develop and provide support mechanisms to advance and further boost the global added value of the **Belmont Forum's** Collaborative Research Action (CRA) on Climate, Environment and Health and its inputs to the relevant EU policy-making processes. This should include the promotion and prioritisation of research and innovation areas during transdisciplinary conferences, meetings and workshops, capacity building related to relevant stakeholder involvement, cross-fertilisation activities amongst **Belmont Forum**, EU- funded and relevant nationally funded projects, synthesis of their results, with a particular focus on policy making, such as knowledge based policy briefs, dissemination, communication and outreach.

Cooperation with relevant existing projects under Societal Challenge 1 and 5 of Horizon 2020, including relevant ongoing Coordination and Support Actions, is encouraged.

Actions should also provide support to a knowledge management platform of EU funded research and innovation on the linkages between health and climate, support the **Belmont Forum** Members, partners and secretariat, in relation to this CRA and support the organisation of an international conference on climate change and health.

Cooperation with the relevant services, expert groups and mechanisms of the European Commission will be required to provide evidence-based policy advice, and report on the CRA results and synthesis of their findings. Actions should also build upon EU research and innovation framework programmes and avoid duplication and overlaps.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** The project results are expected to:

- contribute to policy advice on climate change and health at international and EU level and supporting the EU's international commitments with respect to the Paris Agreement, UNFCCC and others related to climate change and health sciences;
- bolstering a network of projects funded under the CRA call with relevant EU-funded projects addressing climate, environment and health;
- better flow of information and knowledge dissemination on climate change, environment and health to low and medium income countries;
- raising global awareness of climate impacts on human, plant and animal health.

<b>Horizon 2020 Pillar:</b>	Societal Challenges
<b>Programme:</b>	Climate action, environment, resource efficiency and raw materials
<b>Call Title:</b>	Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement
<b>Call Identifier:</b>	h2020-lc-cla-2018-2019-2020
<b>Topic Title:</b>	Towards a comprehensive European mountain research strategy
<b>Topic Identifier:</b>	LC-CLA-23-2020
<b>Type of Action:</b>	CSA Coordination and support action
<b>Deadline(s):</b>	13.02.2020 (single-stage)

**Participant Portal Weblink:**

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/lc-cla-23-2020>

**Specific Challenges:** European mountain regions play a central role for the well-being of many highly populated European regions for instance for water and energy supply, weather regimes, recreation and tourism. European mountain regions are home to a high degree of biodiversity, including many endemic species that occur nowhere else. However, mountain regions are expected to react far more sensitively to global change than other parts of the world. Therefore, research on sustainability of these regions is important not only for the population living there and the many tourists visiting them (e.g. 150 Millions/year for the Alps) but for a significant part of Europe's population. European countries operate excellent research infrastructures in mountain regions and are leading in many fields concerning climate, ecosystems, life in extreme environments, pollution monitoring and other aspects. Making the most efficient use of these resources and the latest scientific developments for addressing the abovementioned challenges, while contributing to climate change mitigation efforts targeted at this specific ecosystem, requires a high degree of coordination within Europe and beyond. Hence, a prominent challenge for this topic is to support and coordinate research and innovation to advance the understanding of current changes in mountain areas derived from climate changes, the synergies with other human-related forcing, the prediction of potential changes in these regions, and to foster observations for a sound monitoring of the regions.

**Scope:** The action should coordinate and support mountain regions research in Europe and develop a comprehensive European Mountain Research Strategy building on existing European activities. This strategy should aim to support the development of services necessary for the adaptation to climate change and the improvement and extension of observations, in particular in-situ ones, for the monitoring of the mountain regions. In line with Responsible Research and Innovation (RRI), citizens, civil society organisations and other relevant stakeholders should be involved in the co-design of the research strategy. This initiative strives for enhanced coordination with international research organisations and programmes related to mountain regions research (e.g. WMO, ESA, GEO, NEMOR and JPI 'Climate') as well as with relevant operational services including Copernicus. This action should support the implementation of the EU Strategy for the Alpine Region – EUSALP (<https://www.alpine-region.eu/>) and the GEO global Network for Observation and information in Mountain Environment – GEO-GNOME ([http://earthobservations.org/geoss\\_wp.php](http://earthobservations.org/geoss_wp.php)), and take advantage of other regional and thematic networks initiatives that are being developed in Europe.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international cooperation is encouraged, in particular with countries such as Canada, **China**, India, Russia, United States, and Latin American countries.

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

**Expected Impact:** The project results are expected to contribute to:

- substantially raising the scale and ambition of inter-disciplinary mountain regions research policy in Europe;
- improved coherent and efficient use of European resources for mountain research;
- significant extension of the Copernicus and EuroGEOSS services and products to the mountain regions;
- step change in the domain of open data access, quality control and interoperability for mountain region monitoring and adapting to climate change.

**Cross-cutting Priorities:** International cooperation