ERA-NETs
SUSFOOD2 and FOSC

Joint Call 2021

Pre-Announcement

"Innovative solutions for resilient, climate-smart and sustainable food systems"

Envisaged launch of the Call: 17 May 2021
Envisaged deadline for proposals: 16 August 2021

Content

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No 727473 and 862555, respectively.

1 Background of the Joint Call "Innovative solutions for resilient, climate-smart and sustainable food systems"

1.1 About ERA-NET SUSFOOD2 and FOSC

The ERA-NET Cofund instrument under Horizon 2020 is designed to support public-public partnerships between EU Member States (and associated countries) for the implementation and coordination of networking activities in different fields of research. The ERA-NETs SUSFOOD2 and FOSC (SF2/FOSC) build a joint network with 13 funding bodies from 12 countries to launch this Joint Call (Annex B).

The ERA-NET Cofund SUSFOOD2 "SUStainable FOOD production and consumption" started in January 2017, and is the continuation of the FP7 ERA-NET SUSFOOD (2011-2014). The strategic goal of SUSFOOD2 complements the EU bioeconomy and food policies, and aims to reinforce cooperation in research, development and innovation between EU members and associated states in order to maximize the contribution of research to the development of more sustainable food systems from production to consumption. The scope of SUSFOOD covers the entire food supply chain, with the main focus on food chain sustainability beyond the farm gate. The farm level is considered if it has direct impact on the sustainability of the other steps in the food chain.
For more information, please consult http://susfood-era.net

FOSC is the ERA-Net Cofund action on Food Systems and Climate. FOSC is built upon and supported by the experience from FACCE-JPI and LEAP-Agri. FOSC was launched in October 2019 and will run for five years. The consortium consists of 28 partners from Europe, Africa and Latin America. FOSC addresses one of our world's major challenges: how to feed 10 billion people by 2050. The ambition of FOSC is to implement a range of joint activities to contribute to the creation of a strong and effective trans-national research and innovation network between Europe, Africa and Latin America.
The main challenge of FOSC is to contribute to the achievement of food and nutrition security within the context of sustainable food systems, considering the three dimensions of sustainability (social, environmental, and economic).
For more information, please consult https://www.foscera.net

1.2 Background/context

The UN estimates the world population to reach 9.7 billion people by 2050 and for it to peak at 11 billion in 2100 (UN, 2019). Consequently, global demand for food is expected to increase significantly, intensifying the competition for natural resources and increasing environmental impacts such as greenhouse gas emissions, deforestation and land degradation from food production.

The food sector is by far responsible for the largest consumption of natural resource creating an enormous strain on the environment. An estimated 60% of global terrestrial biodiversity loss is related to food production; food systems account for around 24% of the global greenhouse gas emissions and

an estimated 33% of soils are moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction and chemical pollution.

In addition to the direct environmental impacts on natural resources of food production, 13.8% of food produced is lost "from the farm up to, but excluding, the retail stage". A significant amount of raw commodities is wasted throughout harvesting, distribution, processing and manufacturing across the food supply chain. At low-income level countries, most waste occurs in the early stages of the supply chain, mostly due to inefficient harvesting systems, poor technology, or inefficient storage and transportation. At high-income level countries, as much as 50% of food wastage occurs at the household level. Food waste causes an unnecessary pressure on land, water and energy resources that in their turn generate 8–10% of all global greenhouse gas emissions. Moreover, loss of resources has related social and economic costs, with the yearly burden of wasted food estimated at €900 billion in economic costs and around €800 billion in social costs.

This situation stresses the need to increase the sustainability of our food systems to meet demand for food and support quality of life for present and future generations.

Sustainability of food systems is defined here as "a food system that supports food security, makes optimal use of natural and human resources, and respects biodiversity and ecosystems for present and future generations, which is culturally acceptable and accessible, environmentally sound and economically fair and viable, and provides the consumer with nutritionally adequate, safe, healthy and affordable food".

However, food systems have become increasingly complex with interdependencies across distant geographical areas. Food systems functioning often depends on an intricate organisation of resources and activities in different parts of the world, as well as on a web of virtual and physical infrastructures and on multiple governance levels. Alongside positive outcomes, these interdependencies also generate system vulnerabilities to a wide range of factors and conditions, including system shocks.

Recent shocks, like the socioeconomic crisis provoked by the COVID-19 pandemic worldwide, and the desert locust plague in large parts of Africa and Asia, had dramatic and unexpected impacts on the life and livelihood of people, with important consequences for food systems functions and outcomes. This new interconnected world highlights the need for research directed to make food systems less vulnerable and more resilient to system shocks. In this context, resilience is defined as the ability to withstand, i.e. to better resist stresses and shocks and the capacity of this entity to bounce back rapidly from the impact. It entails the capability to cope with a shock, when it occurs, but also to be prepared to adapt better to a new situation.

Policy and research are increasingly concerned with the occurrence of major perturbations. The recent SCAR 5th Foresight Report "Resilience and transformation" highlights the importance of enhancing system resilience. It dedicates one section to lessons learned from the "COVID-19" pandemic and points out to "Coping with disaster" as one of the cross-cutting issues that must be addressed in future

research on food systems.

Awareness of the highly diversified impacts that these shocks produce on different social groups is crucial to identify risks and solutions that affect different groups. In the words of the Foresight experts, “understanding how shocks hit some people and regions worse than others and how best to prepare for the unknown” is one of the main challenges we must face. Enhanced understanding of the trade-offs and synergies between food security, biodiversity, ecosystems and climate might support decision taking when system shocks occur.

The “European Union's Action Plan for Resilience” recommends increasing the effort to assess risk scenarios, reduce vulnerability and enhance the ability of individuals, communities and countries to absorb and recover from shocks. A logical option to meet this objective is the improvement of methodologies and tools to measure the risk of humanitarian crises and help to prevent, mitigate and prepare for them.

The European Commission’s attention to these issues is made apparent in strategic documents like the EC COM “A clean Planet for all” and “From Farm to Fork”, which highlight the importance of robust and resilient farming and food systems that function in all circumstances.

The development of more sustainable and resilient food systems is in line with the Sustainable Development Goals of the United nations and will bring opportunities for new technologies and business models that will concurrently improve environmental and human health outcomes, employment opportunities, prosperity, equity and the wellbeing of human communities.

Scope of the Call

This Joint Call initiative by SUSFOOD2/FOSC network originated under the premise that attaining resilient and sustainable food systems would require a transition from current linear food production systems, which are vulnerable to system shocks, to resilient circular systems that encompass efficiency, side-stream valorisation and avoidance of food loss and waste and consider the interdependencies within the systems and its stakeholders. Such a transition will have to be accompanied by substantial progress in the organisation and management of food systems and supported by the development of novel technologies, which will play a key role to support the transformation of food systems so they operate within natural resource boundaries with minor climate change impact.

Food systems comprise food production activities, processing and packaging, distribution and retail, as well as consumption. Various factors, like environmental and socio-economic drivers, influence the systems and therefore, different approaches can affect the resilience and sustainability of such a complex network. Moreover, the diversity of food systems (local, high-tech, traditional, etc.) raise the need to find the right approach to increase their sustainability and resilience.

The aim of the Call is to foster scientifically excellent, multi-disciplinary and multi-actor research, development and innovation projects. We will support projects taking a systems approach considering all relevant aspects in food systems and their potential to increase its sustainability (Topic 1) and resilience (Topic 2). Spatial scales can be different, from local focus to projections at the regional or macro-regional levels.

2 Joint Call topics and cross-cutting issues

The topics of the Joint Call are:

Topic I: Innovations to improve food systems sustainability, with a focus on increasing resource efficiency and reducing waste
Topic II: Food Systems adaptation and resilience to system shocks

These two topics detailed in Annex A: Call text.
Interested project consortia should apply to one of the two topics.

We envisage that the transition towards sustainable food systems will need close consideration of the following cross-cutting issues, which should be taken into account across all topics and individually adapted to each project:

- **Multi-actor-approach**: Involve different actors and stakeholders in your research project from the outset (by means of participation as well as transparent communication),
- **Multi-disciplinary approach**: Take account of different viewpoints and involve disciplines beyond your existing network,
- **System approach**: Consider interconnections, synergies or trade-offs between different aspects or actors that directly or indirectly affect your field of research on a systems level, considering all economic, environmental, social, legislative, geographical, behavioural, business and environment dimensions.

The inclusion of these cross-cutting issues is intended to increase the value and impact of projects.

3 Funding modalities and who can apply

The following partner countries will provide funds for the Call: **Algeria, Belgium (F.R.S.-FNRS and VLAIO), Estonia, Finland, France, Ireland, Italy, Morocco, Norway, Romania, Turkey, and the United Kingdom.** A list with the partners **per topic** can be found in Annex B.

The funding for transnational projects will be based on a virtual common pot instrument. This means that applicants of projects that have been selected for funding will receive the grant directly from their national funding bodies according to their terms and conditions.
Institutions (legal entities) that are involved in research/innovation and operate in accordance with national rules, including companies and stakeholder organizations, are invited to apply.

What to do now?

1. Develop a research idea.
2. Work with colleagues in the scientific community to build a multi-actor project consortium involving researchers and other stakeholders.
3. Decide whether you would like to be project coordinator or participant in a project.
4. Use the partnering tool provided by the Joint Call Office for partner search in case you are looking for partners to build your consortium (www.submission-susfood-era.net/sf2-fosc-jointcall)
5. Get more information on the websites www.susfood-era.net and www.foscera.net
6. Start drafting your proposal with your consortium.
7. Be alert to the official Call announcement (17 May 2021) and get ready to submit your application online via www.submission-susfood-era.net/sf2-fosc-jointcall.

4 Indicative Time schedule

The Joint Call will follow a 1-step procedure. A time schedule is provided below (tentative, changes can occur, please see final time schedule in the Call Announcement (17 May 2021).

Action	**Schedule**
Launch of the Call	17 May 2021
Webinar for interested applicants	2 June 2021
Closing date for submission of proposals	**16 August 2021 - 3 p.m. CEST**
Expert evaluation and Selection of projects	Until November 2021
Notification letters sent to applicants	Begin of December 2021
Contract negotiations	December 2021 onwards
Start of projects	December 2021 – April 2022

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Annex A: Call text

Topic I: Innovations to improve food systems sustainability, with a focus on increasing resource efficiency and reducing waste

Background

Improving food systems sustainability is a challenging endeavour, because the complexity of food systems requires a holistic and coordinated approach to avoid undesired effects from actions in specific supply chain areas in other sections. All stakeholders and elements within food systems, as well as the relationships and related effects across the supply chain must be taken into account.

In order to be sustainable, food systems need to generate positive value along three dimensions at the same time: economic, social and environmental. Given the urgency of the climate crisis and the fact that current unsustainable food systems contribute to climate change in a profound way, sustainable food systems have to meet the environmental dimension of sustainability, which means climate smart and reduced contribution to climate change.

An additional challenge is to balance aspects of food production related to the social dimension of sustainability, more precisely public health, accessibility to food and consumer satisfaction such as preserving the product quality (including food safety, food security and nutritional value) and important characteristics (taste, affordability) required by the consumers. An option to improve the sustainability of food systems without compromising food security and quality is to increase efficiency and circularity of resource use throughout the whole food systems and to reduce food loss and waste. However, sustainable food systems are not only efficient but are also based on sufficiency, which allows for reductions in production and consumption while enabling sustainable food chains, and are consistent with the carrying capacity of ecosystems, the ecological balance and the territorial, cultural and socio-economic context.

To further support the transition towards a sustainable, resilient, efficient, competitive and profitable food and drink sector as well as better planning and organisation of the value chain, in combination with a systemic approach, it is essential to consider all the steps involved in food production from farm to fork.

Research to develop these systematic changes will need a combination of expertise from various areas and dialogue with relevant stakeholders in the food systems to improve acceptability and practical uptake of results.

Research Themes

Towards this overall aim, an exemplary but not exhaustive list of possible research themes related to these objectives is presented below. The listing order does not reflect priorities.

- There is an expectation that all topics will embed innovative thinking and approaches
- Identification of leverage and intervention points to improve food systems sustainability by reducing the use of non-renewable resources (water, energy, land);
- Reduction of food loss and waste in food systems;
- Consideration of the circular economy concept and redesign of the food value chain from farm to fork towards sustainability, (climate) resilience and diversity, with a focus on valorisation and use of side streams to retain resources in the system as long as possible, and implementation of sustainable materials and products;
- Assessing and/or developing methods to improve the sustainability of the packaging, transport and storage of food (smart logistics, improved storage or recycling technologies);
- Analysis of the effects and potential trade-offs of new products, services, businesses and marketing strategies that promote new sustainable ways for actors along the value chain;
- Identification of incentives and barriers to the uptake of existing strategies, solutions and tools (e.g. reusable shoppers and food containers, minimal packaging designs, last-minute marketing platforms and applications, other digital technologies), validation of the benefits of these strategies for users/consumers, and assessment of technical and economic performance at a system level;
- Analysis of the influence of socio-economic aspects and consumer behaviour on sustainability;
- Analysis of the impact of increased sustainability and sufficiency of food systems on the socio-cultural environment.

Expected Outcomes

- Increased understanding of the effects and impacts of new and emerging technologies to support the shift towards sustainable food systems;
- Evaluated critical points and intervention points and recommended actions to improve the sustainability of food systems;
- Improved efficiency in the use and re-use of raw materials and resources (energy, water etc.) on the food system level, and hence reduced negative impacts on the environment;
- Better understanding of socio-economic drivers and leverage points to reduce food waste within whole supply chains and food systems;
- Intervention strategies to reduce waste in the food chain and re-use of valuable components to the benefit of industry, policy makers and end-users;
- Increased uptake of technological and social innovations, contributing to greater circularity and sustainability within food systems;
- Assessments of the relevance of socio-economic determinants on sustainable diets and behaviour.
- Improve the understanding of how to mainstream resource efficiency and sufficiency on consumer level.

Topic II: Food Systems adaptation and resilience to system shocks

Background

The need for food systems less vulnerable and more resilient to changing environments and shocks has been dramatically exacerbated by recent crises, like the COVID-19 pandemic and the desert locust plague. The COVID-19 pandemic is an unprecedented event in modern times and, among other devastating impacts on human lives and livelihoods it represents a huge challenge to existing practices in the global food systems. The origin of the pandemic seems to be related to food markets, and its direct and indirect effects on the food systems range from the disruption of food chains under lock-down regimes to the breakdown of some system activities due to population density in a location. Less debated in the media, but still dramatic in its effects, is the shock created by the 2019-2021 desert locust plague, which is threatening the food security of East Africa, the Arabian Peninsula and the Indian subcontinent.

More shocks are expected due to climate change. Climate change is not a shock in a strict sense, but rather a stressor that progressively modifies the conditions under which farming and other food systems functions interact. Tackling climate change is a challenge in itself, and the food systems are called to contribute towards climate change mitigation (as addressed in Topic 1), and to flexibly react to it.

Climate change is leading to the occurrence of more frequent “extreme weather events”, often geographically focused. We refer to well-known events like floods, droughts, wildfires, etc. Moreover, climate change influences other shocks like pests or diseases, or sudden biodiversity losses that weaken or endanger the delivery of ecosystem services.
In addition, the increasing complexity of our societies, alongside benefits and positive outcomes, leads to exposure to other kinds of shocks, like political shocks, technological breakdowns or market shocks and financial crises. Many of these shocks are inter-related, sometimes mutually reinforcing. Some are to a certain extent known, although not fully predictable, others are unknown and cannot be predicted, like natural disasters. However, each of them affects the food systems in specific ways and uncertainty shall not be an argument for inaction.

This topic focuses on the exploration of food systems vulnerability to shocks and the identification of solutions aimed at improving the capacity to adapt and to be resilient when single or multiple shocks occur. Projects must contribute to the identification and assessment of possible solutions for increasing food systems’ resilience to system shocks. This could also require the exploration of shocks and related challenges and mapping them.

Research Themes

Towards this overall aim, an exemplary but not exhaustive list of possible research themes related to these objectives is shown below. The listing order does not reflect priorities.

- Identifying and assessing the possible shocks that can impact food systems;
- Pin-pointing elements, activities and outcomes of the food systems that are most vulnerable to the various types of shocks. For example, the functioning of market channels and logistics are among the system activities that can be mainly impacted by a pandemic, whereas farming can be mainly impacted by extreme weather events;
- Understanding how and why shocks hit some regions or some social groups worse than others and which measures can be explored;
- Understanding the societal aspects of resilience-oriented innovation, analysing how social and cultural habits can either speed up or slow down change.
- Identifying and testing solutions to reduce the impact of possible system shocks, with particular regard to the loss of food security, and to enhance system resilience. Different shocks may require different solutions;
- Exploring and suggesting manageable solutions to be prepared for the unknown and minimising risks related to threats that are less predictable and less known than the ones we are already facing. These solutions include, but are not limited to, the development of prevention measures, and the valorisation of diversity at various levels: from agro-biodiversity to diversity in supply chains, business models, dietary habits, etc.;
- Identifying and analysing synergies and trade-offs, between solutions for resilience and efficiency, as well as possible trade-offs among solutions (organisational, technological, economic, and so on) tailored to face different types of shocks;
- Exploring solutions for a better interaction between policy, economy, research, education and society to strengthen food system resilience;
- Understanding positive effects of shocks.

Expected Outcomes

- Forecast and horizon scanning for possible shocks and of vulnerable activities and outcomes of food systems with a focus on specific regional or social groups;
- Description of the societal influence on resilience-oriented innovation, with attention to how social and cultural habits can either speed or block change;
- Solutions to reduce the impact of system shocks, with particular regard to the loss of food security, and to enhance system resilience;
- Recommendation of food policies from local to transnational level that foster sustainable food systems, including food system adaptation and resilience to system shocks.
- Solutions for preparedness for the unknown and for minimising risks related to less predictable threats;
- Identification of synergies and trade-offs between different solutions for the same shock or for different types of shocks.

Annex B: Funding bodies

Country	Institution	TOPIC 1	TOPIC 2
Algeria	Directorate General For Scientific Research and Technological Development (DGRSDT)/ Ministry of Higher Education and Scientific Research (MESRS)	x	x
Belgium	Fonds de la Recherche Scientifique – FNRS (F.R.S.-FNRS)	x	x
Belgium	Flanders Innovation and Entrepreneurship (VLAIO)	x	x
Estonia	Ministry of Rural Affairs (MEM)	x	x
Finland	Ministry of Agriculture and Forestry (MMM)	x	x
France	The French National Research Agency (ANR)		x
Ireland	Department of Agriculture, Food and the Marine (DAFM)	x	x
Italy	Ministry of Agricultural Food and Forestry Policies (MIPAAF)	x	x
Morocco	Ministry of National Education, Vocational Training, Higher Education and Scientific Research (MENFPESRS)	x	x
Norway	The Research Council of Norway (RCN)		x
Romania	The Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)	x	x
Turkey	The Scientific and Technological Research Council of Turkey (TÜBİTAK)	x	x
United Kingdom	Department for Food, Environment and Rural Affairs (DEFRA)	x	x