# FACCE-JPI
# Implementation Plan
2018-2020



Joint Programming
Initiative on
Agriculture,
Food Security
and Climate Change

FACCEJPI

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# Content

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## List of acronyms and abbreviations

| | |
|---|---|
| CAP | European Common Agricultural Policy |
| CCAFS | CGIAR initiative on Climate Change, Agriculture and Food Security |
| EC | European Commission |
| EJP | European Joint Programme Cofund |
| ERA-NET Cofund | European Research Area Network Cofund |
| GB | Governing Board |
| GHG | Greenhouse gas |
| GRA | Global Research Alliance on Agricultural Greenhouse Gases |
| H2020 | Horizon 2020 |
| HDHL | A Healthy Diet for a Healthy Life |
| IP | Implementation Plan |
| JPI | Joint Programming Initiative |
| JRC | Joint Research Centre |
| MACSUR | Modelling European Agriculture with Climate Change for Food Security |
| NSF | US National Science Foundation |
| SAB | Scientific Advisory Board |
| SCAR | Standing Committee on Agricultural Research |
| SDG | Sustainable Development Goals |
| StAB | Stakeholder Advisory Board |
| SRA | Strategic Research Agenda |
| USDA NIFA | United States Department of Agriculture National Institute of Food and Agriculture |

## Summary

Since 2010, FACCE-JPI has been building a portfolio of research actions to address the five core themes in its Strategic Research Agenda[1]. These have been set out in successive Implementation Plans (IP 2014-2015, 2016-2018). Here, thirteen joint research actions are proposed for the 2018-2020 Implementation Plan. Meanwhile a number of former actions are still ongoing (see Annex 1). The thirteen new actions comprise:

- 2 ERA-NET Cofunds
- 1 (non-co-funded) joint call between 3 ERA-NETs
- 1 European Joint Programme (EJP) Cofund
- 2 Knowledge Hubs
- 1 joint action for which the specific instrument still needs to be defined
- 4 exploratory workshops aimed at identifying the type of work FACCE-JPI could undertake on a specific topic in the future, and
- 2 cross-cutting valorisation activities aimed at better communicating and disseminating FACCE-JPI scientific results to national/EU policymakers and other stakeholders

The joint actions proposed herein rely on different types of instruments and require different amounts of investment. Moreover, they are at different stages of discussion and development. Most joint actions have already been discussed in dedicated Working Groups and/or undergone some scoping work with SAB/StAB and expert involvement. Others, such as exploratory workshops, are one-off events that aim to provide insight into future research needs. In each case, actions aim to fulfil the objectives set out in the FACCE-JPI Strategic Research Agenda and to interact and cooperate, as appropriate, with existing FACCE-JPI, EU and international actions.

Two activities are of particular note: FACCE-JPI has been instrumental in facilitating the process of having an EJP Cofund on agricultural soil management in the European Commission's 2018-2020 work programme. This action, which will mobilise significant resources, aims to align EU research in this area, relying largely on institutional resources in Member States. It is therefore an important action under the FACCE-JPI umbrella.

A second activity that will take on increasing importance during this period is the valorisation of FACCE-JPI research results. FACCE-JPI has developed a Communication and Valorisation Strategy "Science for Policy and Impact" to exploit research outcomes and to optimise their value and impact on the global societal challenge eventually feeding into policy and evidence-based decision making. Valorisation workshops will be organised to carry out this work (see action 13).

[1] https://www.faccejpi.com/

# Introduction

The Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) aims to build an integrated European Research Area addressing the challenges at the crossroads of agriculture, food security and climate change. It brings together 24 member countries[2] as well as New Zealand as an associate member.

FACCE-JPI seeks to improve the alignment of national and European research programmes, to increase high quality transnational research activities within food security, agriculture and climate change, and to improve the societal impact on the challenge of food security, agriculture and climate change. Indeed, the challenges of food security, climate change, and resource depletion surpass what can be addressed at the national level alone. Even if the work in different countries gives rise to numerous advances, it is imperative to establish a genuine European cooperation around a common vision and shared objectives and instruments.

To meet this challenge, FACCE-JPI published its first Strategic Research Agenda (SRA) in 2012 followed by two Implementation Plans in 2013 and in 2016, respectively. FACCE-JPI has established a number of common research actions[3], mobilising around €120M of national funding as of September 2018. For a list of finished and ongoing FACCE-JPI actions, see Annex 1.

In November 2015, the FACCE-JPI Governing Board (GB) adopted an update of the SRA taking into account both scientific advances as well as FACCE-JPI's own achievements and the international policy context. The new SRA updated the five Core Themes and listed a number of priority actions, taking better account of the socio-economic aspects, the need to inform relevant policies and the need for impact.

In order to implement the updated SRA, FACCE-JPI has elaborated a third Implementation Plan to cover the period 2018 - 2020. This Implementation Plan describes the joint actions that the FACCE-JPI GB will undertake in this period, based on priorities described in the FACCE-JPI SRA. The joint actions proposed herein rely on different types of instruments and require different amounts of investment. Moreover, they are at different stages of discussion and development. Most joint actions have already been discussed in dedicated Working Groups and/or undergone some scoping work with SAB/StAB (Scientific Advisory Board and Stakeholder Advisory Board) and expert involvement, e.g., proposed European Joint Programme on Agricultural Soils and the ERA-NET on Sustainable Crop Production, which explains why their descriptions are lengthier than for other actions and their proposed start date already known. Others, such as exploratory workshops, are one-off events that aim to provide insight into future research needs. In each case, actions aim to fulfil the objectives set out in the FACCE-JPI Strategic Research Agenda and to interact and cooperate, as appropriate, with existing FACCE-JPI, EU and international actions.

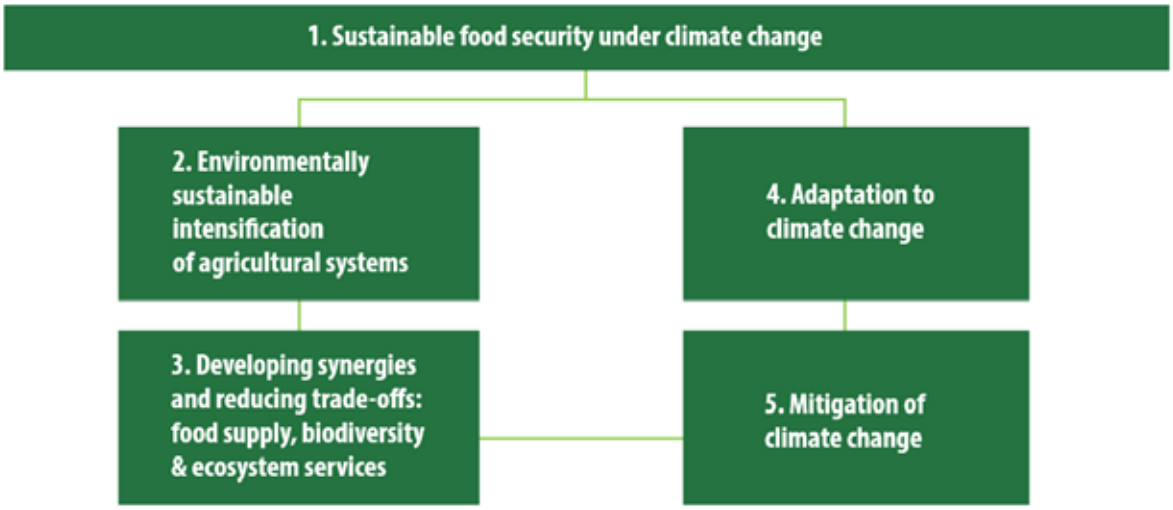


**Figure 1.** The five Core Themes of the FACCE-JPI Strategic Research Agenda

[2] Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, The Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey and UK; New Zealand is an Associate Member from 2016

[3] See https://www.faccejpi.com/

# The Actions

# Core Theme 1
## Sustainable Food Security under Climate Change

### 1. Follow up action to Knowledge Hub MACSUR: Modelling the Impacts of Climate Change on Food Security

MACSUR (Modelling European Agriculture with Climate Change for Food Security) was the Knowledge Hub of FACCE-JPI which brought together the excellence of research in modelling grasslands, livestock, crops, farms and agricultural trade in order to improve the modelling of climate change impacts on European agriculture and in order to illustrate to political decision makers how climate will affect regional farming systems and food production in Europe[4]. Following two phases (2012-2015, 2015-2017), MACSUR ended in June 2017 and was subsequently evaluated by an international expert panel.

Based on the MACSUR 2 evaluation and the feedback of funders, a new action should focus on capitalising on MACSUR results. A future action could concentrate on using (MACSUR) modelling results towards carbon neutral food systems, based on policy needs, and thus focussing on a strong science-policy dialogue. This could be in the form of a new type of Knowledge Hub that is more focused and which concentrates only on knowledge transfer with no research. The aim could be to synthesise our knowledge to make it more useful for policymaking or for practical purposes. This would be related to valorisation and to bridging the science-policy interface. The Joint Research Centre (JRC) should be associated to this.

Another option (not mutually exclusive) would be to put in place a new type of action for policy relevant research programming (new "instrument") in which countries define their own national policy needs (for example through national workshops involving stakeholders) based on scenarios, using a set of commonly defined specifications. These national workshops would define the key priorities on policy and scenarios and what researchers would need. The results of these workshops could feed into a European workshop to define the policy needs and to ask modellers to respond to the questions/needs defined in the workshops. The workshop would include the JRC and take into account other work, e.g. SCAR foresight. Depending on the results, this could give rise to a research call.

Both options depend on either existing national funding being dedicated to this work or additional funding in new projects being earmarked for these activities.

The proposed start date of the MACSUR follow-up is **mid 2019**.

Coordination/cooperation will be sought with: the JRC Peseta IV programme, JPI Climate (AXIS ERA-NET), USDA NIFA, NSF, UN Sustainable Development Network

### 2. ERA-NET Cofund on Climate Change and Food Systems

The text in the Horizon 2020 work programme for 2018-2020 is as follows:

SFS-31-2019: ERANETs in agri-food (sub-topic: Climate change and food systems)

**Specific Challenge**

The agri-food sector is subject to multiple external pressures, such as rising demand for food, competition for land and other natural resources with other biomass uses, globalisation, threats from animal or plant diseases, environmental changes and public health considerations. This implies the need for the sector to become more efficient and sustainable; improve its impact on consumer health; take advantage of new technological developments; and become more transparent and responsive to consumer demands, within a food-system approach.

**Scope**

Proposals under this sub-topic will aim at developing climate-resilient and sustainable value chains for food systems. In particular, they will assess risks and vulnerabilities of food systems faced with climate change, thereby offering low carbon footprint solutions (technological and/or non-technological) to increase resilience and sustainability. Specific focus will be put on the socio-economic impacts of climate change on different food chains, price volatility and the territorial dimension on access to accessible and nutritious foodstuffs. Complementarity with SUSFOOD2 ERA-NET will be ensured throughout the project development stages.

[4] https://macsur.eu/

**Expected Impact**

- Improve coordination between national and EU funding and ensure better use of resources in the priority research area
- Reduce the environmental footprint of the sector by reducing inputs and waste
- Develop innovative solutions to cope with the multiple risks and challenges to the food systems posed by global environmental changes

The proposed start date of this ERA-NET is **2019**.

Coordination/cooperation will be sought with: the Belmont Forum 2nd Collaborative Research Action on Food Security and Safety, LEAP Agri ERA-NET, JPI Climate, SUSFOOD2 ERA-NET, PRIMA Art. 185, USDA NIFA

## 3. Knowledge Hub on Food and Nutrition Security (with JPI Healthy Diet for a Healthy Life and JPI Oceans)

FACCE-JPI and JPI HDHL (Healthy Diet for a Healthy Life) organised an event at EXPO 2015, called "A Grand debate on Nutrition Security – a whole system approach" and two scoping workshops that involved JPI Oceans in April and July 2016. These joint actions generated two papers describing potential future joint activities. A working group of funders is currently exploring implementing this topic (see Annex 2) as a Knowledge Hub.

In order to achieve sustainable and resilient food systems that provide nutritious food from both land and sea, it is necessary to know both the composition of a nutritious diet and also how climate change will affect food production and the nutritional quality of food, through effects on the quality of agricultural and marine primary products. This Knowledge Hub aims to bring together different research domains and national and international research investments and ensure involvement of key stakeholders including consumers, industry etc.

The provisional scope is: "The impact of climate change on the nutritional make up of food: Aligning food production and human health by looking at climate change effects on nutritional composition of food and feed".

**Expected Impact**

The action will contribute to developing the knowledge base needed to realise guidelines for producing and consuming food that include resilience, sustainability and food nutrition aspects. Additionally, it will provide:

- Industrial showcases of new and adapted food products that demonstrate the economic viability of more healthy and sustainable products
- Targeted policy briefs that provide holistic advice on food systems
- A roadmap for future research needs

Specific outcomes of the Knowledge Hub will deliver impact to the four main stakeholder groups: Producers (in a broad sense), Agrifood Industry (post-farmgate), Consumers and Regulatory authorities.

The proposed start date for this Knowledge Hub is **2018**.

Coordination/cooperation will be sought with: H2020 Coordination and Support Action (CSA) Fit for Food2030

## 4. Exploratory Workshop on Coordinating Policies to Support Food and Nutrition Security in the Context of Climate Change

This topic was elaborated by FACCE-JPI and JPI HDHL (Healthy Diet for a Healthy Life) following the workshop organised at EXPO2015.

**Specific Challenge**

Governance practices and regulations have an important role to play in promoting Food and Nutrition Security (FNS), and need to simultaneously address public health, food and climate change targets. Climate change affects several dimensions of FNS: supply and stability, given risks of climate shocks to the food system (e.g. a 10% reduction in global crop yields would be expected every 30 years); nutritional quality, as micronutrient and protein contents decline; and food safety, given risks of increased food-borne diseases.

Such policies must be underpinned by an evidence base derived from rigorous transdisciplinary scientific research. Through regulations related to dietary guidelines (for example, the labelling of foods), subsidising food production in ways that promote healthy eating practices, introducing regulations to promote efficient food production and encouraging specific food consumption practices, the government can play a large role in ensuring food availability and healthy, non-wasteful consumer food choices. However, policies originating in different parts of the food, health and climate change (environment) sectors may have conflicting measures, or due to lack of coordination miss the opportunity to generate synergies between policy areas. Policies which target only a single driver of FNS may have unintended impacts on food systems and interact with climate change. For instance, nutritional security may target reductions in consumption of products with a high carbon footprint, creating synergies, or could, conversely, require intensive production systems with high climate and environmental footprints.

It is important to consider the impacts of policies on human and environmental health and socioeconomic factors, at the same time taking due account of ethical concerns associated with, for example, specific production practices, income distribution in value chains or inequalities in health across the population. Policies must be aligned to ensure that they address health, climate, socioeconomic and environmental challenges and are not operationalised independently within sectors. For example, there may be a trade-off between obtaining optimal nutrition levels for some versus ensuring adequate nutrition for all, and it is important to ensure that the equity of distribution of benefit of policies applies to the most excluded members of society as well as the most affluent. Responding to increasing food demand driven by population growth and dietary change is more than just increasing food supplies and food production, but also entails actions that can shape consumer demands towards more sustainable and healthy diets.

In addition, polices may have unintended consequences which act against the intended policy goals. For example, policies focusing on taxing unhealthy foods (in order to mitigate obesity) are being advocated. Unintended consequences, such as the effects of an increase in the overall cost of food, must be considered, and, where such taxes are already imposed, their effects on FNS monitored. Generally, policies related to FNS should be monitored and evaluated in the same holistic way, and should consider both supply and demand characteristics of the entire food system and implications for trade and for the impacts on less developed countries. This requires the development of research that brings together not only different disciplines (e.g. health, agriculture, aquaculture, psychology, economics and policy sciences), but also ensures that all key stakeholders (e.g. the primary producers, food industry and consumers) are consulted regarding the appropriateness and potential for unintended effects of such policies. Such a holistic approach enables the development of a framework for directing research investment towards science-based evidence which can be translated into effective and actionable FNS policies. Attention should also be paid to supply and demand issues, price volatility, income effects in value chains, interactions between institutions in the private and public sectors, and strategies to develop a portfolio of policy responses which can be utilised in response to different potential food security and system resilience challenges.

**Scope**

An important goal of the holistic approach is to simultaneously consider multiple outcomes, for example, food availability and the nutritional quality of food in the context of climate change. There is a need to integrate existing data sets and models in order to answer some of the urgent questions associated with FNS. Aside from the question of duplication of effort in collecting new data, it is important to collate and integrate data from different disciplines in order to understand the complex interactions which drive food and nutrition (in)security outcomes, in particular across experimental and observational studies, and between the natural and social sciences. It is also important for researchers to discuss, throughout the research cycle, the policy translation of their research with policy makers and stakeholders across multiple sectors, in order to understand the limitations of evidence that can be delivered through the scientific process. Policy translation of scientific outcomes, including the development and validation of policy tools, should be embedded in future research activities in the area of FNS. All of this, however, is contingent on changes in consumer behaviours. Unfortunately, many policy interventions designed to change dietary choices and behaviours at a population level have met with limited success. They have nearly always focused on improved consumer health, reduced consumer food waste, or other goals such as understanding the consumer acceptance of technological innovations.

Future joint research activities might include identification of consistency and trade-offs between health and sustainability objectives in the composition and quantity of diets, systematic review of existing European policies which target sustainable and

efficient food production and waste reduction, healthy dietary choices (and physical activity), and prevention of diet-related chronic disease as well as climate-driven policies for agriculture and land use. In parallel, it would be important to evaluate the intended and unintended effects of such policies simultaneously on human health, the environment and climate change. Examples of such policies include the European Common Agricultural Policy (CAP) reforms, soil and water policies, and taxation policies on unhealthy foods, public health campaigns focused on increased vegetable consumption or local production practices and interventions promoting reduced consumer waste. It is, however, essential that the impacts of these policies are considered simultaneously, and to this end a holistic analysis is required, after which it can be combined with a better insight into behavioural change to ensure optimal policy implementation.

An emerging question concerns policies related to personalisation of diets. Demographic changes, for example, ageing in affluent European countries, is resulting in changing dietary requirements across the population. At the same time, there is an increased interest in being able to personalise diets in line with phenotypic and genetic differences between individuals. At present, policies related to the personalisation of nutrition are starting to be developed, which raises question about whether such services should be provided by existing health services, governments, or the private sector. It is therefore important to consider at this nascent stage what effects increasingly individualised diets might have on food distribution systems and food localisation policies. More generally, the relation between food distribution systems and localisation of activities with availability, access and composition of diets should be considered.

These questions will require specific collaboration between the two JPIs to contribute to the development of policy tools (e.g. dietary guidelines) which simultaneously address public and environmental health. Information being developed in the current JPI HDHL joint actions DEDIPAC (Determinants of Diet and Physical Activity), BioNH (Biomarkers in Nutrition and Health) and ENPADASI (the European Nutritional Phenotype Assessment and Data Sharing Initiative) as well as the FACCE-JPI Knowledge Hub MACSUR on modelling the impacts of climate change on European food security and the FACCE ERA-NET Plus on Climate Smart Agriculture will begin to provide knowledge to address these questions.

**Expected Impact**

The effectiveness of existing policy interventions will be evaluated, and this knowledge will be used to improve future interventions which simultaneously consider the intended and unintended impacts of potential policies on public health, incomes and climate change. It is important to apply holistic approaches which assess multiple policy outcomes and goals originating in the natural and social environments. In addition, future research needs in relation to gaps in existing knowledge required for effective policy development will be defined. The results will deliver improved human and environmental health across Europe, as well as in-crease the competiveness of European industries (the potential trade-offs on competitive-ness of health and climate policies should be carefully considered) by ensuring that policy implementation relating to climate change goals, labelling or pricing is appropriate and evidence-based.

The proposed start date for this action is **August 2018**.

The proposed date for the workshop is **April - May 2019**.

Coordination/cooperation will be sought with: JPI HDHL,SUSFOOD2 ERA-NET

# Core Theme 2
## Environmentally Sustainable Intensification of Agricultural Systems

### 5. European Joint Programme Cofund[5] on Agricultural Soil Management

This topic is currently in the 2018-2020 H2020 Work Programme. It was developed between the European Commission (Directorate General for Agriculture and Rural Development) and FACCE-JPI. Member State input was sought in an EJP Working Group meeting held in May 2017.

**Specific Challenge**

Good agriculture soil management contributes to food security, climate change mitigation/adaptation and ecosystem services. Preserving and increasing fertility of soils, not least through their organic content and water retaining capacity, increases agricultural production. Soils and their carbon content are also important for climate change mitigation. A number of good soil management practices have been developed to deal with some of the challenges; however serious knowledge gaps exist, e.g. on the characteristics of soils in various regions of Europe, the factors influencing their fertility or their capacity to store carbon, depending on different climate and environment conditions. The European Union is committed to addressing climate change with ambitious targets. An integrated framework for soil research in Europe is required to overcome current fragmentation and unleash the potential of agricultural soils to contribute to climate change mitigation/adaptation, while preserving or increasing agricultural functions.

**Scope**

The European Joint Programme (EJP) will boost soil research with its main emphasis on agricultural soil contribution to climate change mitigation and adaptation. The aim is to construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management (agro-forestry is included in the topic). The activities should look at how management of agricultural soils can reduce degradation of land and soils (in particular soil erosion), preserve and increase fertility of soils and how the processes related to organic content and water retaining capacity can support mitigation and adaptation to climate change. The EJP will evaluate and foster implementation of novel technologies for soil management and carbon sequestration. The aim of the EJP is also to look for synergies between different approaches used in Europe for farm level accounting of emissions and removals from agricultural activities and particularly of carbon storage. In doing so, activities will look into inventories, measurements, reporting and accounting activities. Sustainable agricultural productivity and environmental aspects will also be targeted in connection with climate change mitigation and adaptation, so that optimisation of land management is ensured.

The EJP will include joint programming and execution of research and other joint integrative activities such as education and training (e.g. short-term missions and workshops), knowledge management, access to experimental facilities and databases, including harmonisation and standardisation. State-of-the-art technologies for mapping and soil sampling (physical, chemical and biological parameters) should be explored for wider and simple use from national level to farm level. In return, e.g. by developing new ICT tools, this could help farmers to protect and manage soils in line with current scientific understanding of processes. The EJP should also facilitate sampling and further development of the LUCAS[6] European Soil Database as well as supporting the EU's contribution to global soil mapping activities.

Participating legal entities must have research funding and/or management responsibilities in the field of agriculture soil management. The proposal should include a five-year roadmap describing the key priorities and governance processes as well as the first annual work plan. The acquired knowledge should support policy-making in the domain of agricultural soil management and related policies, such as agriculture, climate and environment, and when feasible and appropriate transfer of science to practice for better agricultural soil management by farmers should be envisaged.

The work of the EJP will also support number of policies: Common Agricultural Policy, climate change related policy and relevant environmental policies.

Considering the budget available, the scope covered and the potential entities for the EJP, the Commission considers that an EU contribution to a maximum 50% of the total eligible costs of the action or up to 40 million EUR would allow this specific challenge to be addressed appropriately.

[5] EJP Cofund is a co-fund action designed to support coordinated national research and innovation programmes. The EJP Cofund aims at attracting and pooling a critical mass of national resources on objectives and challenges of Horizon 2020 and at achieving significant economies of scales by adding related Horizon 2020 resources to a joint effort.

[6] Land use/cover area frame statistical survey, abbreviated as LUCAS, is a European field survey program funded and executed by Eurostat http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Land_use/cover_area_frame_survey_%28LUCAS%29

**Expected Impact**

The project will lead to significant long term alignment of research strategies and activities at national and EU level by:

- Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment
- Understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon
- Strengthening scientific cooperation at European level including training of young scientists
- Development of agreed knowledge base and database for European contribution towards international reporting
- Contributing to the European Soil Data Centre with harmonised European soil information for international reporting

The proposed start date for this action is **2019**.

Coordination/ cooperation will be sought with: the Global Soil Partnership and more particularly with European Soil Partnership node; the Global Research Alliance on Agricultural Greenhouse Gases (GRA - Flagship on Soil Carbon Sequestration), 4/1000 international initiative (via the H2020 CIRCASA CSA), GACSA (Global Alliance for Climate Smart Agriculture), JPI Climate (carbon neutrality work), BiodivERsA and soil activities coordinated by the JRC (e.g. European Soil Data Centre)

# Core theme 3

## Developing Synergies and Reducing Trade-Offs Between Food Supply, Biodiversity and Ecosystem Services

### 6. Joint Action on Coping with Climate Change Induced Pressures on Ecosystem Functions and Services in Agricultural Landscapes with BiodivERsA ERA-NET[7]

The multifunctional role of agricultural landscapes continues to challenge EU level policymaking. Greening of the Common Agricultural Policy, through e.g., farm level set-asides has been the most prominent recent initiative to support a more balanced bundle of services from agricultural landscapes and to protect the ecosystem functions agriculture depends on. It is however not fully clear yet to which extent such policies are contributing to this purpose.

Significant advances in research on ecosystem functions and services and their valuation at the landscape scale have provided valuable input to policy processes. However, little is currently known about how climate change may impact these functions and services in agricultural systems. Climate change motivated policies and practices have the potential to strengthen agricultural ecosystems. Increasing organic carbon stocks in the soil maintains soil life and can significantly help agriculture to adapt to the harmful effects of climate change. Reducing nitrogen application rates, optimizing cropping patterns, and protecting existing grassland help reduce GHG emissions, protect soil organic carbon and enhance ecosystem functions and services. Yet, in some cases there might be trade-offs between policies to meet the different policy objectives.

It is therefore important to bring together researchers in the ecosystem functions and services field, and in the climate change and the agriculture research fields to investigate how climate change will influence ecosystem functioning and service provision from agriculture and how this may interact with agricultural policies.

The proposed start date for this action is **2018**.

[7] In June 2018, the governing bodies of FACCE-JPI and BiodivERsA decided to not only identify and implement short-term opportunities for collaboration, but also to establish a longer-term strategic dialogue, developing and implementing a joint vision. This vision would further elaborate collaborative activities to be jointly implemented which would be taken into account in the revision of the initiatives' respective Implementation Plans and possibly Strategic Research Agendas. The short-term opportunities consist in developing collaborative activities by building on ongoing or already planned BiodivERsA and FACCE-JPI activities. The long-term objectives will be (i) to evaluate how both initiatives could best cover the crossroad between biodiversity and agriculture -both initiatives also having an interest in the climate change issue - exploring possible areas for which collaboration would have an added value; and (ii) building on this strategic view, to identify as needed concrete joint actions to be implemented (all types of actions should be considered, not only calls). The first joint activity that will be explored would be joint valorisation activities for the projects funded under the 2013-2014 Call in order to increase the impact of already funded research. It could consist of organising joint valorisation workshop(s) in early 2019 for national/EU policymakers and practitioners - developing joint policy briefs, etc.

# Core Theme 4
## Adaptation to Climate Change

### 7. ERA-NET on Sustainable Crop Production (SusCrop)

This ERA-NET will address the following research topics:

- Enhancement of predictive breeding technologies and development of new genotypes leading to new phenotypes and crop varieties
- Development and exploitation of novel integrated pest and crop management methods and practices
- Improvement of resource-use efficiency of crops and cropping systems
- Systemic research on agricultural crops as part of an ecosystem ("plant as a meta-organism")

The potential of further joint (funded) activities of the consortium without cofunding of the European Commission will be approved and implemented as appropriate.

Through a broad range of accompanying measures that go beyond these funding activities, it will further contribute to:

- Harmonise data collection on sustainable cropping to deliver a database that can be mined to build models and indices of sustainability and resilience
- Develop methods of assessing the sustainability and resilience of cropping systems at different levels (e.g. field, farm, landscape) using ICT-based knowledge technologies

Additionally it will provide a strategic direction for a sustainable crop production for the future.

SusCrop opened a joint call for proposals in **January 2018.** Full proposals ere submitted in August 2018 and the selection of funded projects will take place at the **end of 2018**.

### 8. Exploratory Workshop on Urban (vertical) Agriculture and Adaptation to Climate Change

The share of the world's population that lives in cities and urban areas is already very large and growing. Urban agriculture in different forms (e.g. low-intensity community-based and high-intensity 'vertical' farming) can offer possibilities to increase (urban) food security, enhance sustainable intensification of agriculture and reduce land-related biodiversity risks. It may be developed in a way less prone to climate impacts than traditional agriculture (adaptation) and it may contribute to climate mitigation, e.g. by shortening transport distances. Urban agriculture could also contribute to food security under a changing climate and to broader sustainable development goals. There are many uncertainties as to how these positive effects may be achieved. It is a transversal issue across all FACCE-JPI SRA themes, but is currently not addressed explicitly in the current research actions.

An exploratory workshop will contribute to understanding and identifying the potential of vertical (urban) agriculture to address the objectives of FACCE-JPI (i.e. at the intersection of agriculture, food security and climate change). The workshop, possibly in collaboration with JPI Urban Europe, can inform FACCE-JPI about the opportunities to integrate urban agriculture issues into current initiatives or generate new ideas for future research initiatives for the core themes.

The proposed start date for this action is **mid 2019**.

## 9. Exploratory Workshop on the Application of Novel Breeding Techniques for Adaptation and Mitigation to Climate Change in Crops

This workshop aims to contribute to the assessment of the state of the art of breeding techniques in crops, existing networks and their major stakeholders, and the identification of major challenges and specific opportunities related to climate change adaptation. The action will complement the previous workshop on "Phenotyping, genotyping, breeding, reproduction techniques and evaluating alternative crop species for adaptation to climate change" already organised by FACCE-JPI (Oct. 2016, The Netherlands).

The workshop will be organised in cooperation with the ERA-Net SusCrop given the proximity of the ERA-Net scope to the workshop topic.

This action will:

- Provide an overview of novel breeding techniques in crops; where there are gaps and what are the potentials of respective technologies in the context of climate change.
- Identify what type of work FACCE-JPI could conduct in this area in the future, and how (i.e., work that cannot be done solely at national level, that adds value to existing research and that is requested by end-users).

The workshop will contribute to addressing the SRA priorities of integrated crop management under climate change and adapting seeds through conventional and modern breeding. It is expected to reflect direct impact in participant countries in terms of better knowledge on the topic, policy building and alignment. The action will also provide dissemination and visibility for FACCE-JPI. Concerning the ERA-Net SusCrop, the workshop outcomes will be useful as input for the topic of the second call.

The exploratory workshop will bring together researchers, stakeholders, policy makers and representatives of related initiatives to illuminate the area of "Novel Breeding Techniques in Crops to Adapt to Climate Change" from different perspectives and to elaborate possibilities for FACCE-JPI to step in: State of the art, identification of gaps / opportunities and potential actions in this area.

The proposed start date for this action (preparatory work) is **June 2018**

The proposed date for the workshop is **April – May 2019**.

## 10. Exploratory Workshop on Phenotyping/Genotyping and Novel Breeding Techniques for Adaptation and Mitigation to Climate Change in the Livestock Sector

This workshop will complement the previous FACCE-JPI exploratory workshop on phenotyping/genotyping in the crop sector (Oct. 2016, The Netherlands), as well as the Workshop on Technologies (Nov. 2017, Denmark). The action will also take into account recent joint workshops of ERA-GAS (with ICT-AGRI and ERA-NET SusAn) and will avoid duplication with respect to the upcoming joint call (see Action 11 below).

The workshop is expected to be organised in cooperation with the ERA-NET SusAn and potentially FACCE ERA-GAS, given the proximity of the scope of these ERA-NETs to the workshop topic.

This action will:

- Provide an overview of existing research in this area
- Cover livestock feeding, health, housing and management practices
- Identify on what exactly FACCE-JPI could work in this area, and how, in light of end-user needs, in order to generate more resilient farming systems in Europe

The workshop will contribute to addressing the SRA priority of adapting seeds and breeds through conventional and modern breeding. It is expected to reflect direct impact in participant countries in terms of better knowledge on the topic, policy building and alignment. The action will also provide dissemination and visibility for FACCE-JPI. Concerning the ERA-NET SusAn, the workshop outcomes will be useful for scoping and gap identification.

The exploratory workshop will bring together researchers, stakeholders, policy makers and representatives of related initiatives to illuminate the area of "Phenotyping/ Genotyping and Novel Breeding Techniques in the Livestock Sector to Adapt to Climate Change" from different perspectives and to elaborate possibilities for FACCE-JPI to step in: State of the art, Identification of gaps / opportunities and potential actions in this area

The proposed start date for this action (preparatory work) is **December 2018**.

The proposed date for the workshop is **October - November 2019.**

# Core Theme 5
## Mitigation of Climate Change

### 11. Joint Call between FACCE ERA-GAS ERA-NET, ERA-NET SusAn, and ICT-AGRI-2 ERA-NET on Smart Mitigation of Greenhouse Gas Emissions from Livestock Production

The three ERA-NETs FACCE ERA-GAS, ERA-NET SusAn and ICT-AGRI-2 have worked in close cooperation since 2015 to coordinate and align efforts in areas of mutual interest. Four fundamental cross-cutting areas have been identified by the Cofund ERA-NETs at their onset and marked as potential areas for further scoping for possible joint additional activities. At a first joint workshop held Potsdam in November 2016, one area discussed: Comparison of animal production systems with respect to GHG. The other three areas, Evaluation of Feed Chain, Manure Management, and Reducing Nitrogen Excretion were discussed at a joint workshop in February 2018 in Dublin . The objective was to identify research topics and questions that are most challenging, most urgent, or involve solutions that show the most promise.

Prior to the second workshop partners of all three ERA-NETs were surveyed to gauge interest and preferences in relation to a joint activity. There was positive response and strong interest and support for a joint call. FACCE ERA-GAS, ERA-NET SusAn and ICT- AGRI-2 have agreed to implement a common call for research projects, with a call scope fair to all funders and partners and taking into account the outcomes of both joint workshops.

The start date for this action is **October 2018**.

# Cross-Cutting
## Valorisation Activities

### 12. FACCE-JPI – GRA International Conference on Agricultural GHG Emissions and Food Security – Connecting Research to Policy and Practice

The German Federal Ministry of Food and Agriculture (BMEL) will host a high-level "International Conference on Agricultural GHG Emissions and Food Security – Connecting Research to Policy and Practice" (AgriGHG 2018 Conference) on 10-13 September 2018 in Berlin, Germany. This Conference is organised under the aegis of FACCE-JPI and the Global Research Alliance on Agricultural Greenhouse Gases (GRA) in collaboration with the CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS).

This Conference will provide an excellent opportunity to showcase FACCE-JPI's key achievements to date to national, EU and international policymakers as well as other stakeholders, and better understand the key challenges and research needs ahead.

The event will focus on policies and practices that can help mitigate agricultural GHG emissions while ensuring sustainable and resilient agricultural production and enhanced food security. It will give scientists involved in GRA, FACCE-JPI and CCAFS research programmes an opportunity to collectively reach out to policymakers, farmer organisations and food industry players. More specifically, AgriGHG 2018 aims to:

- Provide an overview of relevant EU and international research activities and highlight the need for action to reduce GHG emissions from agriculture and improve carbon sequestration
- Facilitate a dialogue among all stakeholders involved (researchers, policymakers, farmer and industry representatives) to identify further mitigation action and research opportunities that should be addressed at national, EU and international levels
- Further promote EU and international research cooperation in this area

The International Conference is structured as follows: (1) a 1.5 day Scientific Conference targeted at researchers and scientific experts; (2) a 1.5 day Stakeholder Conference targeted at policymakers and other stakeholders; and (3) a 1 day excursion.

The date for this action is **September 2018**.

Coordination/cooperation will be sought with: GRA, CCAFS

### 13. Valorisation workshops

As proposed in the Communication and Valorisation Strategy (available at faccejpi.com), and started in March 2017 with the pilot valorisation workshop, FACCE-JPI will put in place a series of workshops aimed to valorise FACCE-JPI research project results. In terms of valorisation activities, FACCE-JPI has proposed a framework for exploitation, dissemination and communication of key scientific results by translating them into possible policy and practice options or other outputs in order to improve FACCE-JPI impact and visibility. This will be carried out through a combination of approaches, including dedicated workshops. In addition to the FACCE-ERA-NET Plus final meeting in March 2018, which focused on valorisation and the SURPLUS first call final meeting in November 2018, additional workshops will be organised to reinforce valorisation of FACCE-JPI results and to make them available to end users, including policy makers. FACCE-JPI will organise a series of workshops gathering together researchers and stakeholders.

The valorisation work will aim to:

- Build a dialogue and common understanding between policy needs and research results from funded FACCE-JPI projects
- Identify the most urgent policy needs for which FACCE-JPI funded projects could contribute and identify projects of which results could feed into these needs
- Build teams of researchers and stakeholders who could combine relevant policy questions with the results from different projects in order to co-construct key ideas/key-messages to be further developed as policy and/or practice brief(s)

# Instruments

Alignment of national programmes is a core activity of FACCE-JPI. The FACCE-JPI mission is to achieve, support and promote integration, alignment and joint implementation of national resources under a common SRA to address the diverse challenges in agriculture, food security and climate change. Given the immensity of the societal challenge being addressed, no one can be expected to meet the challenge alone.

By aligning national programming, FACCE-JPI seeks to progress faster towards solutions to solve societal challenges and to avoid duplication, to better cover research gaps, to create critical mass and European added value and to use limited resources more efficiently.

FACCE-JPI has developed a number of tools for alignment, including the Knowledge Hub, the Knowledge Network and the Thematic Annual Programming (TAP) Network. For more information about the last two, please see the FACCE-JPI Implementation Plan 2016-2018.

## Exploratory Workshops

Exploratory workshops aim to bring together national and international experts, funders and FACCE-JPI representatives to explore emerging topics and to evaluate their pertinence for FACCE-JPI. The purpose is to explore topics for which there is a research need that are within the scope of FACCE-JPI and to determine if the topic is being covered by another initiative and to what extent FACCE-JPI should invest in this area. It is expected that workshops will give rise to topics for new FACCE-JPI actions that could enter into subsequent IPs and/or identify partners with whom to collaborate on the said topic. In some cases, workshops may give rise to recommendations, for example of best practices (e.g. on data usage).

## Knowledge Hub

In order to align national research programmes, new ways of working together are required. FACCE-JPI conceived a novel and innovative instrument, the "Knowledge Hub", for its pilot call. A Knowledge Hub associates three complementary dimensions: Research, Networking and Capacity Building. In the case of the pilot Knowledge Hub, a two-step process took place in which researchers submit a Letter of Intent (LoI) to their national funder who then decided eligibility on a competitive or non-competitive basis, according to the countries' own rules. Eligible groups were then invited to submit a full proposal as ONE consortium, which was then reviewed by an international evaluation committee. Countries chose to fund new research or to participate only through the funding of coordination costs which covered networking, additional costs for coordinating and costs for running common activities initiated by the Knowledge Hub. Knowledge Hubs are particularly well suited to research areas with a relatively restricted European community.

## ERA-NETs

ERA-NETs (ERA-NET Plus of FP7 and ERA-NET Cofund of Horizon 2020) are a means of implementing the FACCE-JPI SRA through the alignment of national research programmes via transnational calls. Research projects in ERA-NETs are financed by participating Member States with a top-up from the EC. In addition to a cofunded call, most ERA-NET Cofunds entail "additional activities" which might be additional calls without EC top-up, conferences, workshops, the preparation of a SRA etc. In addition to working with the large number of thematically related existing ERA-NETs (around 15 at the beginning of H2020), FACCE-JPI has proposed five new ERA-NETs to the EC (FACCE-ERA-NET Plus, FACCE SURPLUS, FACCE ERA-GAS, SusCrop and an ERA-NET Cofund on Climate Change and Food System) and works closely with a number of other ERA-NETs (Water Works 2015, ERA-NET SusAn, SUSFOOD2).

## European Joint Programme (EJP) Cofunds

EJP Cofund under Horizon 2020 is a co-funded action designed to support coordinated national research and innovation programmes. The EJP Cofund aims at attracting and pooling a critical mass of national resources on objectives and challenges of Horizon 2020 and at achieving significant economies of scales by adding related Horizon 2020 resources to a joint effort. They allow the implementation of a joint programme of activities, ranging from research and innovation to coordination and networking activities, including training activities, demonstration and dissemination activities, support to third parties, etc.

## Interaction with existing European and international initiatives

FACCE-JPI intends to continue to interact with relevant European initiatives, such as Knowledge and Innovation Communities (KICs), other Joint Programming Initiatives (JPIs), Public Private Partnerships (PPPs), European Innovation Partnerships (EIPs), existing ERA-NETs and infrastructures, as well as with international initiatives, such as the Global Research Alliance (GRA), the 4 per 1000 initiative and the related Coordination and Support Action on soil carbon sequestration (CIRCASA), to name a few. This has been detailed in the FACCE-JPI strategy for cooperation and coordination with European and international initiatives and partners[8]. The aim is to avoid overlaps and duplications and, when appropriate, to work together to form synergies.

[8] See https://www.faccejpi.com/

# Methodology

In preparation for the elaboration the FACCE-JPI Implementation Plan for the 2018-2020 period, an initial brainstorming session amongst the three Boards was held in December 2016. Subsequently, in April 2017, the FACCE-JPI Scientific Advisory Board (SAB) and Stakeholder Advisory Board (StAB) discussed jointly a long list of potential joint research actions and proposed new topics to address remaining research gaps and improve the balance of FACCE-JPI joint actions across the five Core Themes of the Strategic Research Agenda (SRA). The GB voted on the long list, giving rise to a short list. These were discussed in successive GB, SAB and StAB meetings in an iterative process. Finally, the joint actions above are proposed for the FACCE-JPI Implementation Plan 2018-2020.

For each action the following points will be addressed by a Steering Committee / Working Group:

**1. Added value**

- What is the added value of the action in the larger policy context?
- What is the valorisation potential of projects: informing practice, policy, innovation?
- What is the added value of the action with respect to FACCE's overall objectives?
- Are there international links that could/ should be established?
- Do other European initiatives exist that could be linked to this action (e.g. ERA-NETs, EIP, KICs, other JPIs)?
- Should regional aspects to be taken into account to implement this action?

**2. Technical considerations**

- Data and protocols to be shared/ stored
- Innovation aspects to be taken into account in this action
- Technologies (new or existing) that will be important for the success of this action
- The infrastructures related to this topic
- The training and/or mobility component to be taken into consideration

# Annex 1 List of finished and ongoing FACCE-JPI actions

| # | Core Theme | Action | Topic | Type of action | Dates | Number of projects | Total Funding (requested) |
|---|---|---|---|---|---|---|---|
| 1 | 1 | MACSUR | Modeling Climate change impacts on European agriculture and food security | Knowledge Hub | Phase 1 2012 - 2015, Phase 2: 2015 - 2017 | 1, 3 sub-hubs | 8.81M€, 4.11M€ |
| 2 | 4 | FACCE ERA NET + | Climate Smart Agrculture | ERA-NET Plus | 2013 - 2018 | 11 | 15.8M€ |
| 3 | 1 | Belmont Forum Joint call | Food security and land use change | Joint international call | 2013 - 2018 | 4+3 | 6.2M€ |
| 4 | 5 | Multi-partner Call | Agricultural GHG Mitigation | Joint international call | 2013 - 2019 | 11 | 4.93M€ |
| 5 | 3 | BiodivERsA Joint call | Promoting synergies and reducing trade-offs between food supply, biodiversity and ecosystem services | ERA-NET, non-co-funded for FACCE | 2014 - 2018 | 10 | 10.2M€ |
| 6 | 4 | WaterWorks 2015 Joint call | Sustainable water use in agriculture, to increase water use efficiency and reduce soil and water pollution | ERA-NET cofund | 2015 - 2019 | 21 | 17M€ |
| 7 | 2 | FACCE SURPLUS | Sustainable and resilient agriculture for food and non-food systems | ERA-NET cofund | 2016 - 2019 | 14 | 15.1M€ |
| 8 | 2 | KNSI Knowledge Network on Sustainable Intensification | Development of options for sustainable intensification of European crop and livestock systems | Knowledge Network | 2016 - 2019 | NA | |
| 9 | 2 | TAP Soil | Organic matter sequestration in soils | Thematic Annual Programming | 2016 - 2020 (Cluster kick-off June 2018) | 13 (to be increased) | *Average: 7.000-10.000 € / project. |
| 10 | 5 | FACCE ERA-GAS | Monitoring & Mitigation of Greenhouse gases from Agri- and Silvi-culture | ERA-NET cofund | 2016 - 2021 | 10 | 14.1M€ |
| 11 | 2 | SURPLUS Call 2 | Small scale biorefineries | ERA-NET cofund | 2017 - 2021 | 8 | 6.5M€ |

*Supplementary budget granted to each project for the TAP Soil networking activities. Variable amount according to each funder, indicative 7-10% of the total project budget.

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