



# Agriculture, Food Security and Climate Change



## FACCE JPI Implementation Plan

2016 – 2018

[www.faccejpi.com](http://www.faccejpi.com)

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## Acknowledgements

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## List of acronyms and abbreviations

EC	European Commission
GB	Governing Board
GHG	Greenhouse gas
H2020	Horizon 2020
HDHL	JPI Healthy Diet for a Healthy Life
JPI	Joint Programming Initiative
SAB	Scientific Advisory Board
SDG	Sustainable Development Goals
StAB	Stakeholder Advisory Board
SCAR	Standing Committee on Agricultural Research
SRA	Strategic Research Agenda

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# Introduction

Photo: Christian Slagmulder

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 21 member countries<sup>1</sup> 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 a first Implementation Plan in 2013. FACCE-JPI has established a number of common research actions<sup>2</sup>, mobilising around €120M of national funding as of December 2015.

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

## The five Core Themes are:

- 1 Sustainable food security under climate change, based on an integrated food systems perspective modelling, benchmarking and policy research perspective.
- 2 Environmentally sustainable intensification of agricultural systems under current and future climate and resource availability.
- 3 Developing synergies and reducing trade-offs between food supply, biodiversity and ecosystem services.
- 4 Adaptation to climate change throughout the whole food chain, including market repercussions.
- 5 Mitigation of climate change: N<sub>2</sub>O and CH<sub>4</sub> mitigation in the agriculture and forestry sector, carbon sequestration, fossil fuel substitution and mitigating GHG emissions induced by indirect land use change.

Moreover, to take into account the complexity of the challenge, it was decided to continue with the Core Themes but to also take a cross core theme approach. This led to 3 cross-cutting clusters around which joint programmes could be developed. Such an integrative approach will facilitate a broad policy support and use of different lines of action to tackle the challenges.

<sup>1</sup> Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Israel, Italy, The Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey and UK; New Zealand is an Associate Member from 2016

<sup>2</sup> See <https://www.facejpi.com/facejpi/FACCE-Joint-activities>

## These clusters are:

### 1. Land and water management (including soil systems) for climate adaptation and mitigation

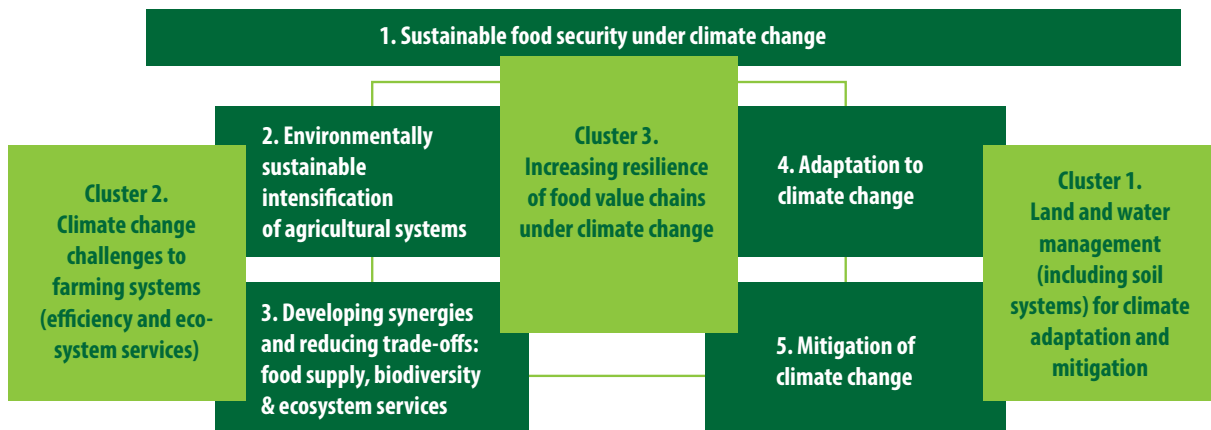
This cluster includes soil systems, links CT4 and CT5, with relevance to CT3.

### 2. Climate change challenges to farming systems (efficiency and ecosystem services)

This cluster brings together CT2 and CT3, and includes: a) the multiple functions required of land under climate change; and b) increasing the efficiency of agriculture supply chains under climate change. This cluster is production-oriented.

### 3. Increasing resilience of food value chains under climate change

CT1 is the core of what FACCE-JPI is trying to achieve, with resilience embedded in each of the CTs. This cluster therefore interfaces with all CTs and is presented as consumer/demand-oriented.



In order to further implement the Strategic Research Agenda, FACCE-JPI has elaborated a second Implementation Plan, to start a set of new actions in the period 2016-2018, in addition to the actions that have started under the first Implementation Plan. 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.

# Policy context



Photo: Dreamstime

FACCE-JPI began in 2010 with the goal of providing coherence in research programming across Europe to meet the societal challenge of jointly ensuring food security, adaptation to climate change impacts and mitigation of greenhouse gases emissions (also referred to as Climate Smart Agriculture). Europe has to meet this triple challenge for its own agriculture and its own food security, and furthermore has a responsibility, particularly given the quality of its research, to contribute to informing European and global policies supporting international agendas – for example the UN Sustainable Development Goals (see below). Indeed, during the time that FACCE-JPI has been running, the European and global context have evolved and FACCE-JPI too has adapted to meet the challenges.

At the European level, following the Lund Declaration in 2009, which calls for greater focus on “Grand Challenges”, the framework programme for research and innovation, Horizon 2020, was launched in 2014. The Lund Declaration of 2015 reiterates the need to work on grand societal challenges. H2020 sets out the European research roadmap up until 2020 and includes three pillars: Excellent science, Industrial Leadership and Societal Challenges. Joint Programming contributes to this call for greater focus on Grand Challenges.

**In addition to H2020, FACCE-JPI also aims to inform EU policies by providing a strong evidence base. This includes policies such as:**

- The Common Agricultural Policy (CAP)
- The EU 2030 climate framework
- The Water Framework Directive
- The European Bioeconomy Strategy<sup>3</sup> which was published in 2012 and will be reviewed and updated by 2017.
- The European Food and Nutrition Security Strategy<sup>4</sup>, to which FACCE-JPI, along with the JPI “Healthy Diet for a Healthy Life”, will continue to contribute.
- The new DG Agri strategy on Agricultural Research and Innovation<sup>5</sup>, which sets out research priorities during H2020 and beyond.

The European Innovation Partnership on Agricultural Productivity and Sustainability (EIP Agri) has been created to bring research results to the market and to enhance the interaction between practice and research. FACCE-JPI will contribute to the goals described in these strategies and initiatives through the research it accomplishes now and in the future. Paying particular attention to the policy context will allow FACCE-JPI to respond to the most pressing research questions and to inform policy. FACCE-JPI has a central role in this new context and through its actions described below, will contribute to achieving the goals described in these European strategies.

<sup>3</sup> Innovating for Sustainable Growth: A Bioeconomy for Europe: [http://ec.europa.eu/research/bioeconomy/pdf/201202\\_](http://ec.europa.eu/research/bioeconomy/pdf/201202_)

<sup>4</sup> The role of research in Global Food and Nutrition Security – Discussion Paper. Expo 2015 EU Scientific Steering Committee: [http://europa.eu/expo2015/sites/default/files/files/FINAL\\_Expo-Discussion-paper\\_lowQ\(1\).pdf](http://europa.eu/expo2015/sites/default/files/files/FINAL_Expo-Discussion-paper_lowQ(1).pdf)

<sup>5</sup> Towards a long-term strategy for European agricultural research and innovation by 2020 and beyond – Background paper. Expo 2015: [http://ec.europa.eu/newsroom/horizon2020/document.cfm?action=display&doc\\_id=9741](http://ec.europa.eu/newsroom/horizon2020/document.cfm?action=display&doc_id=9741)

At the international level, 2015 saw the adoption of the new Sustainable Development Agenda with 17 United Nations Sustainable Development Goals (SDGs)<sup>6</sup>. The aim of this new agenda is both to be more efficient in attaining food security for all and to better integrate the social and ecological dimensions of sustainability (inequalities, biodiversity degradation and greenhouse gases emissions as well as the impacts of future climate changes). Reaching all 17 SDGs will require research but also a transformation of our societies and economies at the global level. Research carried out in FACCE-JPI can contribute to meeting the SDGs and in particular:

SDG2 “End hunger, achieve food security and improved nutrition and promote sustainable Agriculture”

SDG12 “Ensure sustainable consumption and production patterns”

SDG13 “Take urgent action to combat climate change and its impacts”

SDG15 “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”.

A new period for international cooperation on climate change also began in 2015. The 21<sup>st</sup> Conference of Parties to UN Framework Convention on Climate Change (UNFCCC), COP21, gathered in Paris in December 2015, with the intention of setting the foundation of a new universal regime, with mitigation and adapta-

tion on an equal footing. This endeavour is strongly supported by FACCE-JPI, as such a framework is necessary to re-build cooperation and coordination between all countries on ambitious climate policies. The capacity of our societies to produce and access food under a changing climate, and the necessity to mitigate climate change in order not to expose societies to excessively rapid transformations, were already stated as central in the initial text of the UNFCCC. The 2015 Paris Agreement recognised the fundamental priority of safeguarding food security and ending hunger, as well as the particular vulnerabilities of food production systems to the adverse impacts of climate change: food security and agriculture will have to be put at the heart of national and international climate agendas. This is because land use change and agriculture are key controversial sectors of action where progress is needed for adaptation as well as for mitigation in the coming decades.

Moreover, on November 30, the “4/1000 initiative, soils for food security and climate” was launched in Paris. It is the single voluntary action plan proposed for Agriculture under the Lima Paris Agenda for Action (LPAA) which is the fourth pillar of the Climate agreement negotiated at COP21. Given the strong focus on soil and carbon sequestration in this current IP (Thematic Annual Programming (TAP) Network on Agricultural Soil Quality, ERA-GAS ERA-NET on “Monitoring and mitigation of agricultural and forestry greenhouse gases”) FACCE-JPI is now in a position to contribute significantly to the international agenda on soil including the international scientific cooperation programme, 4/1000.

<sup>6</sup> United Nations: The 2030 Agenda for Sustainable Development



Photo: Dreamstime

# Actions

Photo: Dreamstime

**Starting from the updated FACCE-JPI SRA, the GB chose a number of actions for each Core Theme (except Core Theme 3: Developing synergies and reducing trade-offs between food supply, biodiversity and ecosystem services) as well as a number of cross-cutting actions to be carried out in the period 2016-2018.**

**Some of these actions have been proposed to be included in existing or future ERA-NETs. For such actions, FACCE-JPI will continue in discussion with the corresponding ERA-NET to see if the topic matches the scope of the co-funded call, or can be addressed by additional activities of the ERA-NET Cofund.**

**At the mid-term review of the IP it will be assessed to what extent and how topics have been covered. The IP will be adjusted by the GB if necessary, for example to include new FACCE-JPI actions or new collaborations.**



# Core theme 1:

## Sustainable food security under climate change

**Climate change risk assessment for value chains, prices, international trade and food security, including changes in consumer behaviours and wastes**

**Identification of the impact of food losses in the whole chain, and identifying interventions to decrease the waste**

Proposed instrument: SUSFOOD2 ERA-NET main call  
– Lead: Germany

**Assembling existing (and emerging) technologies for primary production, fostering the adoption of improved technologies that are (on the edge of) being mature but not yet widely adopted**

Workshop  
– Lead: Denmark

**Coordinating policies to support food and nutrition security in the context of climate change**

Proposed instrument for scoping this action: SUSFOOD2 ERA-NET  
– workshop as an Additional activity with HDHL  
– Lead: Germany

# Core theme 2:

## Environmentally sustainable intensification of agricultural systems

**Sustainably increasing productivity, resilience and resource use efficiencies (including soil and water) at the agricultural system scale, across regions in Europe, based on improved use of genetic resources and advanced management technologies ('management by measurement') in the context of climate change**

Instrument: Knowledge Network: Development of options for sustainable intensification of European crop and livestock systems  
– Lead: The Netherlands and United Kingdom

**Agricultural Soil Functionality with a focus on carbon sequestration**

To be considered : Increasing economically viable input use efficiency by improving water quality and soil function, and better use of fertilisers

Alternative land use systems (agroforestry, hedges, mixed farming systems) and land and soil management systems (soil conservation, legumes and soil biology) for building above and below ground carbon stocks and increasing biomass production for food and non-food uses

Technical and economic potential of GHG abatement, including enhanced soil carbon storage, in livestock and crop systems and in integrated systems

Instrument: Thematic Annual Programming Network (TAP)  
– Lead: France

## Core theme 3:

Developing synergies and reducing trade-offs between food supply, biodiversity and ecosystem services

**Although there are no actions entirely dedicated to this Core Theme, the issues of biodiversity and ecosystems services will be considered in joint actions, as needed.**

## Core theme 4:

Adaptation to climate change

**Identifying constraints to adapting agricultural land, soil and water management for a variety of local farming systems**

**Increasing economically viable input use efficiency by improving water quality and soil function, and better use of fertilisers**

Instrument: WaterWorks 2015 ERA-NET joint call with FACCE-JPI  
– main call  
– Lead: France

**Adapting specific value chains to climate change from the field to the fork with special emphasis on nutritional quality, food safety and stability accounting for consumer preferences**

Proposed instrument: SUSFOOD2 ERA-NET main call  
– Lead: Germany

**Phenotyping, genotyping, breeding and reproduction for adaptation to climate change with crop, pasture and livestock species and evaluating alternative species**

Workshop  
Lead: The Netherlands

# Core theme 5:

## Mitigation of climate change

**Alternative land use systems (agroforestry, hedges, mixed farming systems) and land and soil management systems (soil conservation, legumes and soil biology) for building above and below ground carbon stocks and increasing biomass production for food and non-food uses**

**Technical and economic potential of GHG abatement, including enhanced soil carbon storage, in livestock and crop systems and in integrated systems**

Instrument: FACCE ERA-GAS – main call  
– Lead: Ireland

**Animal health and disease and GHG mitigation** (possibly with the ERA-NET SusAn)

Proposed instrument: FACCE ERA-GAS – Additional activities  
– Lead: Ireland

## Cross-cutting Topics

**Explore and exploit refinery concepts for the multiple use of biomass under climate change, taking economic and environmental implications into account**

Proposed instrument: FACCE SURPLUS – Additional activity  
– Lead: Germany

**Identifying the potential role of big data for food security with a focus on collecting data, translating data into information, and promoting and facilitating use of information by end-users. Considering: Integrated animal health management under climate change with focus on emerging pests and diseases, interactions between wild and domesticated components at landscape scale**

Workshop  
– Lead: Denmark

**Plant and animal production systems for better human nutrition and resilience to climate change**

Workshop: (with HDHL)  
– Lead: France

**Climate change risk assessment for agricultural production systems (plant and livestock), and food supplies**

**Climate change induced transformation of farming systems towards alternative types of production and links with changes in logistics and relocation of industries, investments. Scale of production is also an issue that we need to link to social and economic dimensions**

Cluster 2 workshop: Climate Change challenges to farming systems (efficiency and ecosystem services)  
– Lead: Germany

**International conference** for bringing together all FACCE-JPI funded projects, stakeholders and policy makers to showcase FACCE-JPI results and to show the impact of FACCE-JPI actions on the societal challenge  
– Lead: France

# Instruments

Photo: Dreamstime

Alignment of national programmes is the 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. Two instruments are new and will be used in this IP: the Knowledge Network and the Thematic Annual Programming (TAP) Network. Besides these FACCE-JPI tools the ERA-NET Cofund instrument will be used.

## Knowledge Network

This is a new instrument currently being developed by FACCE-JPI. While a Knowledge Hub is based on a combination of new and existing activities and is a restricted scientific community comprising one consortium focused on a specific goal, a Knowledge Network is expected to be a broad expert community with, in the centre, a Committee of National Science Leads and Funder Representatives and an informal web of nodes and interactions, formed by ongoing projects,

programmes and various national and international science-policy-practice interactions. The general objectives are to facilitate collaboration across Europe, to increase return on investment of public R&D funding, to create synergy and avoid duplication, and to enable complex research.

## Thematic Annual Programming (TAP)

Means for aligning in the most cost- and time-efficient way are being considered for development that do not involve classic "calls". In this case, based on the SRA, mapping meetings, bibliometrics and advanced poster analysis, topics would be defined which are shared across many countries. National programme managers would then be invited to meet with each other and the SAB and the StAB to define topics to be shared by any new national programme in this area. Mutually agreed text will be included in each national programme participating on a voluntary basis. After launching national programmes, a meeting would be organised among projects working on a given topic to discuss objectives, methods and expected outcomes (project clusters). As part of this coordination, it might be possible to organise a database from project outputs (to be agreed and planned in advance, funded by the JPI). Following a pilot action of this type, programme managers will be invited to evaluate the effectiveness of this approach.

## ERA-NET Cofund

ERA-NET Cofunds 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 (see FACCE-JPI position paper, [www.faccejpi.com](http://www.faccejpi.com)) with a top-up funding from the EC. In addition to a cofunded call, most ERA-NET Cofunds include “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 3 new ERA-NETs to the EC (FACCE ERA-NET Plus, FACCE SURPLUS, FACCE ERA-GAS) and works closely with a number of other ERA-NETs (Water Works 2015, SusAn, SUSFOOD2, CORE ORGANIC).

## 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; Climate KIC and upcoming Food KIC), other Joint Programming Initiatives (JPIs, Water, Climate, A Healthy Diet for a Healthy Life), Public Private Partnerships (PPPs; in particular the BBI), European Innovation Partnerships (EIPs, EIP-Agri), existing ERA-NETs (e.g. ICT-AGRI, C-IPM), and European infrastructures (e.g. ICOS, ANAEE<sup>7</sup>). As well as with international initiatives, such as the Global Research Alliance (GRA) on agricultural greenhouse gases, the Wheat Initiative, the Global Alliance on Climate Smart Agriculture (GACSA), and the CGIAR programme on Climate Change, Agriculture and Food Security (CCAFS), to name a few. This has been detailed in the FACCE-JPI strategy for cooperation and coordination with European and international initiatives and partners which is available on the website. The aim is to avoid overlaps and duplications and, when appropriate, to work together to form synergies.



# Methodology



Photo: Dreamstime

The FACCE-JPI Scientific Advisory Board (SAB) and Stakeholder Advisory Board (StAB) established an initial list of 20 research priorities for the FACCE-JPI Strategic Research Agenda (SRA) (April/May 2015). In preparation for the elaboration of the FACCE-JPI Implementation Plan 2016–2018 (IP), the FACCE-JPI Governing Board (GB) was consulted to suggest additional priorities and any revisions to the topics established by the two boards, resulting in a long list of priorities (June 2015). Additional topics come from 1) exploratory workshops held in the context of the IP 2014–2015 and 2) the common priorities identified by HDHL and FACCE-JPI. A scientific conference bringing together all FACCE-JPI projects is also suggested.

The GB prioritised the topics based on a questionnaire (August/September 2015). In parallel, the SAB expanded on the scientific context of the topics initially established by the two boards (August/September 2015).

As a result of the prioritisation exercise a total of 22 priorities were identified, including areas for research actions and workshops for further scoping. During the GB meeting on November 16–17, 2015, the GB decided which priorities to maintain, which to postpone until a later time and which to merge together. The result is this IP.

The preliminary text prepared by the SAB for each action may be found on the FACCE-JPI website ([www.faccejpi.com](http://www.faccejpi.com)). This text will serve as a starting point for the Working Groups responsible for each action, to be led by GB members.

For each action the following points will be addressed by the Working Group, supported by the Secretariat:

## 1. Added value

- The action in the larger policy context
- The action with respect to FACCE-JPI's overall objectives
- The international links that could/should be established
- The other European initiatives that could be linked to this action (e.g. ERA-NETs, EIP, KICs, other JPIs)
- The regional aspects to be taken into account in 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

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**FACCEJPI**

# Implementation Plan

2016 - 2018