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Milestone 4.2- Assessment of Current Approaches to Alignment:

Case Study No.1- FACCE-JPI Knowledge Hub on Modelling European Agriculture with Climate Change for Food Security (MACSUR)

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ABSTRACT

This case study examines the key features, outputs and overall strengths and weaknesses of a specific alignment modality, namely the **Knowledge Hub** for Modelling European Agriculture with Climate Change for Food Security (MACSUR Phase 1, 2012-15) launched as a pilot activity of the *Joint Programming Initiative on Agriculture, Food Security and Climate Change* (FACCE-JPI). While focussing on the specific experience of FACCE-JPI MACSUR, the case also provides lessons for other JPIs and public-to-public research networks wishing to develop a similar approach to facilitate networking and capacity building amongst European researchers, and to promote alignment more generally. The case study does however not aim to provide an in-depth assessment of the MACSUR Knowledge Hub.

The study highlights the Knowledge Hub's many benefits. MACSUR has enabled to establish a **European interdisciplinary network of scientists** that has facilitated the coordination and pooling of already (nationally) funded research activities in a specific field. This has in turn helped reduce research fragmentation and duplication, and achieve greater cost-efficiency. In addition, the Hub has led to (i) enhanced European research excellence thanks to the generation of new interdisciplinary knowledge on the impacts of climate variability on regional farming systems and food production in Europe; (ii) increased European modelling capacity thanks to joint training and capacity building activities for participating researchers (which has been particularly beneficial to less research intensive countries); and (iii) a better visibility and influence on European and international policymaking (including at the level of the Intergovernmental Panel on Climate Change).

Yet, the MACSUR Knowledge Hub has also suffered from (i) relatively limited Member-State funding (€10M over 3 years for a Hub that gathers over 300 researchers from 18 countries) and diverging financial contributions across participating countries; (ii) limited data-sharing within the Hub; and (iii) a relatively low sustainability potential (in part due to the 3 year funding cycle). Moreover, while the bottom-up governance structure of the Hub has allowed for the re-adjustment of certain activities to new emerging researchers' needs, it has also made centralised coordination and oversight, and the development of a shared common vision amongst participating researchers, more challenging.

The case study builds on the ERALEARN2020 Task 4.1 ("Definition and Typology of Alignment"), and relies on a review of existing literature and targeted interviews with the MACSUR Project Manager and researchers participating in the Knowledge Hub. The case is part of a series of nine short case studies that form the basis of the ERA-LEARN2020 Task 4.2 "Assessment of Current Approaches to Alignment". The nine case studies that have been selected for this Task each rely on a different instrument (Member-State instrument or EC instrument, e.g. ERA-NET), cooperation mode (e.g. networking amongst researchers, programme integration, institutional cooperation, etc.) and alignment approach (strategic, operational and/or financial) and are often put in place at different stages of the research programming cycle (planning, strategy, implementation, etc.).

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1. Introduction

This case study examines the key features, outputs, and overall strengths and weaknesses of a specific alignment modality, namely the Knowledge Hub for Modelling European Agriculture with Climate Change for Food Security (MACSUR Phase 1) launched in the framework of the *Joint Programming Initiative on Agriculture, Food Security and Climate Change* (FACCE-JPI). The study assesses in what context such a tool is best used for promoting greater alignment of national research programmes and activities. While focussing on the specific experience of FACCE-JPI MACSUR1, it also provides **lessons for other JPIs and public-to-public research networks** wishing to develop a similar approach to facilitate networking and capacity building amongst European researchers, and alignment more generally.

According to the Typology of Alignment (ERA-LEARN 2020 Task 4.1), the Knowledge Hub instrument is mostly used by JPIs during the research implementing phase to help establish a **network of researchers** active in a well-delineated thematic area of high priority to participating countries. It is a modality that facilitates alignment at the operational level, and mainly involves individual researchers as well as research funding and performing organisations.

2. Key features of the Knowledge Hub

2.1 Overview

The MACSUR Knowledge Hub was established in June 2012 as a three-year pilot joint activity of the FACCE-JPI (Phase 1 or MACSUR1, 2012-2015). It is a **network** that builds on the concept of "Networks of Excellence"[1] and that gathers European researchers who already have secured (national) funding for modelling and assessing how climate variability and change will potentially affect regional farming systems and food production in Europe and the associated risks and opportunities for European food security. The MACSUR Knowledge Hub initially brought together 180 researchers originating from 17 countries[2] under the coordination of a German research institute, Thünen Institute of Market Analysis. As of 2015, it gathered **300 researchers from 18 countries**.

The Knowledge Hub is divided into three sub-groups or Themes focused on agricultural modelling for crop production (CropM); for livestock and grassland production and farm-level aspects of production (LiveM); and for the assessment of socio-economic impacts (TradeM). Besides **networking** amongst researchers, the MACSUR Knowledge Hub also allows for **capacity building** and the conduct of new **research** coordinated at trans-national level.

MACSUR was launched in order to address the overarching Core Theme 1 of FACCE-JPI's Strategic Research Agenda (SRA) "Sustainable food security under climate change", which, among others, identifies scenario building and modelling as a research topic on which interested FACCE-JPI member-countries should work together jointly.[3] The Knowledge Hub was considered the most suitable tool to address such a topic, since there was a need to **bring together and improve already funded research** and expertise, via enhanced networking, research collaboration and capacity building amongst researchers working on the same topic. In light of its success, FACCE-JPI member-countries decided in June 2014 to renew the Knowledge Hub's mandate until May 2017 (Phase 2 or MACSUR2, 2015-2017).[4]

[1] https://cordis.europa.eu/fp6/instr_noe.htm

[2] Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Israel, Italy, Norway, Poland, Romania, Spain, Sweden, Netherlands, United Kingdom (list of participating research organisations: http://macsur.eu/index.php/about/partners).

[3] FACCE-JPI SRA (2012)

[4] MACSUR2 Proposal

2.2 Mission and activities

The work of the FACCE-JPI MACSUR Knowledge Hub aims to benefit European policymakers, public institutions, farmers, consumers, and extension services (e.g. consultancy firms and technical institutes):

- On a scientific level, MACSUR seeks to advance the science of modelling of agriculture under climate change in order to improve food security through interdisciplinary European collaboration;
- For policymakers, farmers and other stakeholders, MACSUR aims to contribute to better identifying the consequences of climate change adaptation and mitigation measures and the availability, affordability and accessibility of food for populations across Europe; and
- Overall, MACSUR aims at bolstering Europe's capacity to respond to the challenges of food security and climate change and assist countries outside the EU in their endeavours towards food security in the face of climate change.[5]

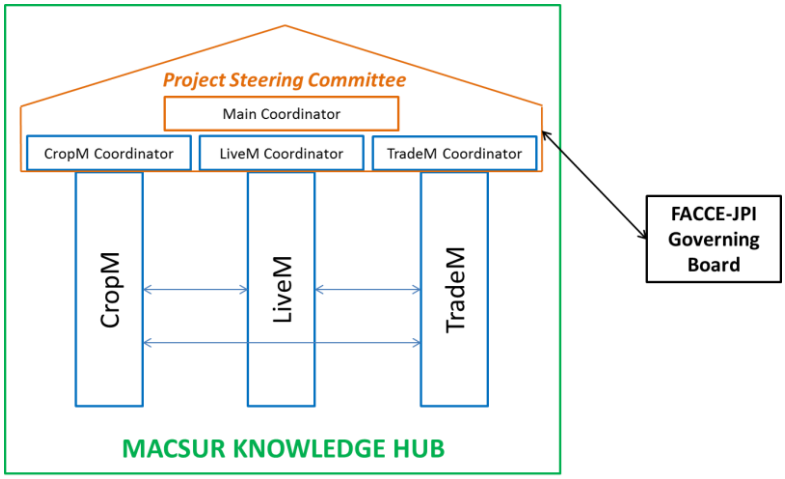
Thereby, MACSUR aims to contribute to FACCE-JPI's overall goals of: (i) improving the alignment of national and European research programmes, (ii) increasing high quality transnational research in the food security, agriculture and climate change nexus, and (iii) improving the societal impact of European research.[6]

Funding for the Knowledge Hub provided by participating countries can be targeted at new research activities and/or coordination and networking activities (which imply coordination costs, travel expenses and costs for running joint workshops, meetings and trainings). All Knowledge Hub activities are carried out by Research Groups which have been selected at **national level** after submitting a Letter of Intent to their national funding agency. The selection criteria were not common to all MACSUR Research Groups; one country could decide to have one or several Research Groups. Research Groups were first encouraged to address national research priorities. In a second instance, they were invited to identify and agree on common research priorities with other countries' Research Groups in order to draft a common transnational research proposal for MACSUR..

2.3 Governance structure

MACSUR's Project Steering Committee is in charge of the coordination of the Knowledge Hub and ensures regular communication with national representatives in FACCE-JPI's Governing Board. It facilitates the interaction between the three MACSUR Themes in line with the main objectives of the Hub (see Fig. 1). A management unit supports all organisational and secretarial tasks.

Figure 1. Structure of the Knowledge Hub



Source: MACSUR website

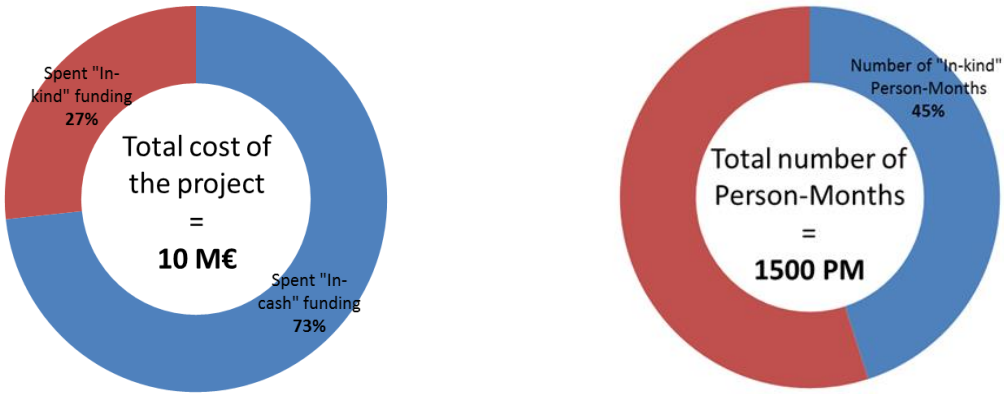
[5] MACSUR First Phase Report 2012-2015
[6] FACCE-JPI SRA (2016)

2.4 Approximate resources and time needed for implementation

MACSUR brings together research groups that already work and have funding in a specific thematic area. Its operation relies on **Member-States funding**, which totalled approximately €10.1 million during the first 3-year period. MACSUR's funding relies on (i) Members States' **in-kind contributions of €2.7 million** (e.g. researchers salaries), aimed at facilitating the convergence of already funded and on-going research, and (ii) Members States' **in-cash contributions of €7.4 million,** which allow to finance coordination and networking activities as well as the funding of new research activities that are part of the MACSUR common research agenda (see Fig. 2 below). Financing originates from national research funding agencies or ministries[7], with the selection of research groups, the amount of funds and the regulation of their use governed at the **national level**.

A wide spread among national in-cash contributions is however noteworthy (between €0 and 1M€). The FACCE-JPI Secretariat, which is mainly financed by the European Commission (via a Coordination and Support Action), has supported the launch of the Hub.

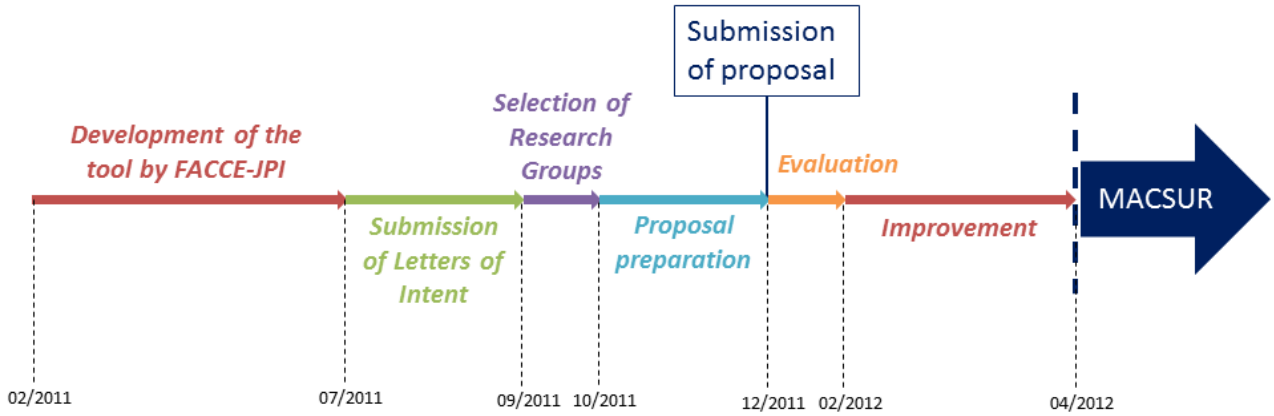
Figure 2. Resources used during Phase 1 (2012-2015)



Source: MACSUR First Phase Report 2012-2015

The timeline presented in Fig. 3 below indicates that approximately **14 months** were required in order to launch the Knowledge Hub (see Annex 2 for more information).

Figure 3. Timeline for implementation



Source: Presentation "FACCE-JPI Knowledge Hub" (26.09.2012, Berlin)

[7] The list of funding agencies/ministries are available at:
http://macsur.eu/images/web_content/ProjectDocuments/CA_with_Annexes_FINAL+Access.pdf

3. Principal outputs to date

The main outputs listed below[8] have greatly contributed to the **advancement of European modelling capacities across several disciplines,** thanks to structured joint description and comparisons of models and methodologies, model evaluation (including stakeholder requirements) and improvement of models and integrated models. In particular, **trans-national data management** is in the process of being improved with the intention of developing a common data classification and rating tool for exploration of existing data sets, the publishing of data sets generated by MACSUR[9] and the harmonisation of databases, which is key for generating future joint research. So far, MACSUR has supported:

- The publication of joint scientific papers (278 articles in peer-reviewed journals and submitted manuscripts, of which 172 are joint publications) and contributions to books and reports (including the report of the Intergovernmental Panel on Climate Change (IPCC));
- The development of applied regional case studies (currently in Finland, Austria and Italy) that allow to assist policy makers and actors in the agri-food chain in identifying effective and efficient adaptation and mitigation measures and potential consequence scenarios;
- The development of common "European Representative Agricultural Pathways" as an input to global scenario exercises (linked to the socio-economic and greenhouse gas concentration IPCC scenarios);
- The organisation of 8 major international congresses and presentations in over 450 scientific conferences;
- The organisation of training courses and workshops;
- The improvement of media coverage, e.g. via overview papers in high-profile journals and the maintenance of a website also targeting a non-academic audience.

4. Overall strengths of this tool, including key achievements

The Knowledge Hub offers many benefits for researchers and stakeholders. It facilitates a greater coordination and pooling of existing research activities in a specific field, which allows to achieve greater funding efficiency but also enhanced research excellence, impact and capacity in Europe, hence being an important tool for alignment, particularly at the operational level. Key benefits are outlined below.

4.1 Strong operational alignment thanks to the establishment of an interdisciplinary network of scientists

MACSUR has enhanced the collaboration of researchers across borders, triggered greater critical mass and improved regular personal interactions especially through meetings between specialists, workshops and scientific congresses, fostering "*a vibrant community of international researchers*".[10] MACSUR has identified a common transnational research priority and pooled together existing research regarding this specific focus, thus helping **avoid fragmentation of research,** and as such contributing to increased alignment amongst national research activities. The common MACSUR research agenda reflects the will to jointly prioritise research questions (e.g. with the selection of regional case studies), synchronise timing of national research programmes in the concerned area of research, avoid duplications and enhance research synergies across Europe.

In particular, the Knowledge Hub has brought together modelling experts and scientists in all concerned fields of agricultural research and increased multi-disciplinary interactions, enabling scientists from different backgrounds to meet (as they would probably not have met if MACSUR did not exist). The coordination of a large number of researchers has facilitated alignment at operational level. This is something which would have not been possible at the level of individual research organisations. In addition, **trust-building and mutual understanding** of knowledge requirements in other disciplines has improved. Moreover, the Knowledge Hub is an effective framework to facilitate the subsequent implementation of **other actions and tools** that foster alignment, such as joint research programmes and coordination of scientific techniques.

[8] Summary of Results of MACSUR1 (2015); MACSUR First Phase Report (2015)
[9] http://macsur.eu/index.php/toolbelt-preview
[10] MACSUR First Phase Report 2012-2015

4.2 Scientific excellence: Generation of new European knowledge thanks to the pooling of existing research

The Knowledge Hub has allowed an efficient **sharing of existing knowledge** within and across science disciplines as well as a **collective production of new knowledge**. In particular, the process of generating new knowledge has been facilitated through MACSUR by enabling cross-disciplinary teams to meet, agree on common objectives and work together (e.g. through the matchmaking activity of MACSUR to bring together relevant partners for new project calls). Thus, interdisciplinary cooperation and coordination between various scientific fields have significantly improved *within* each Theme (CropM, LiveM and TradeM) and should further improve in the future, including through the increasing cooperation *across* Themes (i.e. cross-cutting activities planned in MACSUR2), in order to carry out integrated impact assessments of climate variability on farming systems and food security. This has in turn triggered breakthroughs and innovations in the field of modelling (thanks to the possibility of comparing different models by meta-analyses). Significant advancements in agricultural modelling have also been achieved thanks to the division of the Knowledge Hub into its three focus Themes.

4.3 High flexibility of the Knowledge Hub structure

After elaborating a common research proposal, Knowledge Hub participants have had the possibility to reorganise their tasks and responsibilities in the Hub if needed. Hence, significant decision-making power was attributed to participating researchers. In several participating countries there were no mandatory deliverables or milestones, and hence no real defined obligations as it is the case in a typical research project. Although this has led to difficulties in respecting deadlines and in governing the Hub (see also point 5.2 below), the Knowledge Hub structure also gave room for **a higher responsiveness to emerging needs** while allowing researchers to spend less time on reporting. Even though several activities that were initially planned in the MACSUR proposal have not been implemented, ideas for many other activities that were not planned at the beginning of MACSUR but that emerged during the networking and joint knowledge creation process could be taken forward by MACSUR participants.

4.4 Effective capacity building of researchers

The Knowledge Hub offers joint training of young and senior researchers and support for junior researchers to participate in workshops and conferences. The exchange and comparison of models, model outcomes and scenarios directly contributes to an increased capacity of European research as it gives a common basis for new research. In particular, MACSUR represents an **opportunity for less research-intensive countries** which can more easily pick up on current trends and methodologies, initiate contacts with established sub-networks and become involved in cutting-edge project proposals involving MACSUR partners. More generally, the Knowledge Hub has led to the adoption of good-practice examples from other participating scientific communities.

4.5 Greater cost-effectiveness and high return on investment

MACSUR's funding mechanism allows for a greater convergence across nationally funded research activities and helps fosters joint activities**,** which trigger **economies of scale** (e.g. joint training of a large number of researchers at the same time on a same topic). Moreover, despite the relatively small amounts of national funding invested, significant results have been achieved at the Knowledge Hub level thanks to its shared framework and joint activities. Moreover, the Knowledge Hub has triggered a **high leverage and return on investment**: while the MACSUR1 project cost around €10 million, new external grant money resulting from MACSUR networking activities and supporting new project consortia involving MACSUR members amounted to almost €17.5 million.[11] For example, while the United Kingdom only contributed "glue" money (money for networking and coordination) to the Knowledge Hub, the UK Research Councils and the Scottish National Government subsequently made strong investments in the modelling area.[12]

[11] MACSUR First Phase Report 2012-2015: list of projects and associated funding provided in Annex B8.

[12] Policy Brief on impact assessment of networks (2015)

4.6 Increased visibility and influence on European and international policymaking

The introduction of the Knowledge Hub has led to the establishment of a modelling **network that represents Europe** (as opposed to individual European countries), which can in turn collaborate more easily with other international networks. MACSUR is involved in the global exercise of comparing models, for instance through its partnership with the Agricultural Model Intercomparison and Improvement Project (AgMIP).[13] Furthermore, national research organisations participating in MACSUR increase their visibility and are encouraged to improve their own national coordination through the visibility and coordination of the Hub.

MACSUR has helped raise awareness on the potential impacts of Climate Change on European agriculture and food security. Policy-relevant outcomes have been fostered through interaction with stakeholders. Finally, MACSUR members have also been able to influence national research programs through publications, descriptions of MACSUR's contributions in scientific meetings/workshops/congresses and FACCE meetings/reports, as well as through direct interaction with national representatives.

5. Overall limitations with this tool, including difficulties encountered during implementation

The following limitations can generally be encountered when implementing a tool such as a Knowledge Hub.

5.1 Funding limitations

Funding within individual Knowledge Hub Work Packages has been too limited, thus hindering opportunities for participation and active contribution of MACSUR members in meetings and workshops[14]. Furthermore, participating countries with more limited financial resources could not be as involved as others in the Knowledge Hub's activities since funding is not redistributed. This has also been the case for certain scientific disciplines which suffer from lower access to funds. Furthermore, additional funding and staff is lacking for organisational tasks such as project management, internal communication and organisation within the Knowledge Hub and external interactions, which has hindered the overall progress of strategic decision-making.

While having several benefits, **in-kind contributions** have led to strong limitations in space, time, purpose and legal conditions. In addition, they cannot be redistributed across activities by the Hub's coordinators.[15] A greater amount of in-cash funding would have allowed for more flexibility in implementing new MACSUR research activities. Moreover, no clear common definition of what is a national in-kind contribution has been given: countries hence do not always speak the same language in terms of funding (difference in types of costs covered and order of magnitude), which can lead to difficulties in jointly carrying out coordinated research or networking activities. Furthermore, the **divergence of in-cash funding across participating countries** – some only receiving cash for a few travels, others being able to hire more staff to carry out new MACSUR research activities or to be involved in the overall coordination of the Hub – has led to strong differences in the leadership capacity across countries.

5.2 Limits of the decentralised bottom-up approach

The decentralised funding mechanism of the Knowledge Hub has triggered a bottom-up organisation and a decision-making process by consensus. While such an approach has brought some benefits, such as increased flexibility and responsiveness to emerging researchers' needs (see point 4.3 above), this structure has not been as effective as a top-down governance structure in coordinating the Hub's activities and in developing a common vision for the latter. In addition, the decentralised evaluation and selection process of participating researcher groups**,** which took place at national levels, hindered the clear definition of the scope of the Hub's work. Finally, due to the lack of a strong and centralised MACSUR decision-making body, it was also challenging to redirect participating countries' financial commitments towards other activities suggested by the FACCE-JPI Governing Board, such as stakeholder engagement.

[13] Köchy et al. (2015). The collaboration between AgMIP and MACSUR
[14] MACSUR2 Proposal
[15] MACSUR First Phase Report 2012-2015

This approach has also led to **difficulties regarding inter-operability**: as MACSUR relies on national in-kind and in-cash commitments towards a virtual common pot, national rules apply when it comes to deciding which costs are covered and what type of reporting is required. Administrative set-ups and rules greatly differ from one country to another (e.g. regarding funding periods, access to funding for travelling or carrying out research), which has complicated the implementation of MACSUR's activities. Similarly, reporting requirements have not been coordinated among participating countries and FACCE-JPI.

5.3 Lack of coordination regarding data sharing among the MACSUR community

Despite the wish to develop common data management mechanisms and harmonise databases across participating countries, actual data sharing has been harder to achieve within the whole community. Producing data such as climate impact data relevant to agricultural modelling is of high value; it has sometimes been difficult to openly share it among MACSUR participants. However, the added value of sharing such data for improving and comparing models and modelling techniques is also to be considered, especially when willing to participate in a collective initiative such as MACSUR. This is why MACSUR members have been encouraged to share model outcomes and developed scenarios amongst all Hub participants.

5.4 Questionable sustainability potential

The long-term sustainability of the network is hard to evaluate since it relies mainly on the sustainability of its funding system, which was initially guaranteed for 3 years only. This period of time is short regarding the scale of the research concerned and does not sufficiently allow scientists to project their activities into the future. Furthermore, some of MACSUR's outcomes are not easily measured, which also makes it hard to assess the Hub's longer-term impact and sustainability potential. For example, quantifying knowledge sharing or joint learning is a delicate task, although these processes are fundamental to continuous research capacity building and relevant knowledge production.

Lessons learned from other networking experiences

DEDIPAC (Determinants of Diet and Physical Activity) Knowledge Hub

The DEDIPAC Knowledge Hub was implemented as the first action of the JPI "A Healthy Diet for a Healthy Life" in order to improve understanding of the determinants of dietary, physical activity and sedentary behaviours. As MACSUR, it has also adopted a **common research agenda** which is associated with a specific project structure divided into three Thematic Areas which would correspond to MACSUR2 cross-cutting activities. The Hub helps strengthen linkages between different fields of research.

The main outcome of the Hub is expected to be a **toolbox gathering harmonized infrastructures, methodologies and results** which can be easily accessed and used by stakeholders and decision-makers according to their needs. This toolbox aims to influence policies and stakeholders' activities. DEDIPAC's concern for long-term sustainability is illustrated by its will to build new collaborations and develop its capacity building and dissemination strategies.

COST Action (European Cooperation in Science and Technology)

COST Actions are the main instrument developed by COST, a European framework for cooperation in Science and Technology. They enable the establishment of **networks of (mainly) European researchers** and professionals in order to tackle defined societal challenges. COST Actions are bottom-up tools, i.e. driven by scientists themselves. A COST Action **does not fund additional research but only networking activities** through specific activities which are also used in JPI Knowledge Hubs (e.g. workshops, trainings, etc.).

Yet unlike JPI Knowledge Hubs, COST Actions imply the nomination of a COST National Coordinator for each COST Member Country (who promotes COST Actions within the country), and an independent scientific rapporteur who evaluates the management of the Actions. Another major difference is that they do not trigger the development of a common research agenda, as is the case in the MACSUR and DEDIPAC Knowledge Hubs.

The uniqueness of COST Actions is the involvement of **non-academic partners** originating from industry and governmental bodies, which facilitates the dissemination of research results and practices. Cost Actions also have a strong focus on international partner countries, Inclusiveness Target Countries, gender balance and integration of young researchers.

Source: Lakerveld et al. (2014); DEDIPAC (2015), Periodic Report 0.1.4.; COST Brief and Presentation (September 2015).

6. Conclusions: Suitability and key factors of success

The Knowledge Hub tool implemented in the context of a JPI or another P2P network is well adapted to **well-delineated, interdisciplinary and transnational scientific challenges** which are of **high priority** to participating countries. A Knowledge Hub is most suited for promoting knowledge sharing and joint learning. Hence it can be used when there is already on-going **funded research**. The aim of this tool is to promote alignment mainly at operational level by not only creating a network of scientists (i.e. exchange of knowledge), but also strengthening their capacity and knowledge in a specific research field, and helping them jointly carry out research. The number of researchers involved has to be carefully managed and may have to be limited in order to keep the Knowledge Hub efficient in coordinating networking and research activities.

Key factors of success:

1) At strategic level:

- **Clearly delineate the scope of the Hub:** The Knowledge Hub tool is more efficient when focusing on a well-delineated area of research. It is also important to interlink activities in an efficient way in order to provide relevant consolidated results at the European level.
- **Put in place a balanced governance structure:** In addition, a clear governance model should be defined in order to achieve an efficient complementarity between bottom-up and top-down decision-making processes. A top-down definition of the research strategy should take account of the desire for "ownership" and strong involvement of scientists and the need for flexibility at the researchers' level.

2) At financial level:

- Secure **long-term funding for networking and coordination tasks** to provide a backbone (hub) for internal and external links.
- Develop an **adapted funding mechanism** for the use of the Knowledge Hub tool: this could for instance lead to the creation a common pot allowing for the redistribution of fresh money according to the availability of financial resources across regions/countries and disciplines (e.g. for travelling or to carry out new research activities). A balanced contribution of in-kind funding and fresh money is also more effective, as in-kind funding comes with some restrictions.

3) At operational level:

- Ensure an **efficient management** of activities: e.g. regular meetings of the project steering committee, support of the secretariat, regular meetings for researchers/coordinators involved in interdisciplinary tasks and meetings for researchers involved in specific research disciplines, newsletters.
- Avoid artificial structural barriers by (i) **adapting the reporting system,** to avoid double reporting (i.e. at country and JPI level); and (ii) **aligning national administrative rules** which would contribute to greater inter-operability (e.g. funding periods, equal eligibility rules for knowledge hub members to travel to meetings and carry out new research).
- Elaborate a strategy to **increase visibility and dissemination:** This can in turn contribute to greater sustainability thanks to media coverage, international partnerships, joint publications, organisations of and participation to major scientific congresses, strong interaction with national representatives to influence national research programmes and with the private sector to create relevant innovations.
- Design a strategy for **capacity building and data sharing** in order to improve knowledge creation and contribute to the sustainability of the network (e.g. through training, workshops and support for young researchers).

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Dietl, M. (2015). Presentation at the ERA-LEARN 2020 Workshop on the Practical Implementation of Alignment: Learning from Good Practice "*COST - Advancing alignment via networking and capacity building amongst researchers*", September 2015.

Loyen, A. (2015). Presentation at the ERA-LEARN 2020 Workshop on the Practical Implementation of Alignment: Learning from Good Practice "*DEterminants of DIet and Physical ACtivity (DEDIPAC) Knowledge Hub*", September 2015.

Tinois, N. (2012). Presentation "*Joining Forces in Europe: Agriculture, Food Security and Climate Change - FACCE-JPI Knowledge Hub*", September 2012.

(3) Consulted websites

COST: http://www.cost.eu/

DEDIPAC: https://www.dedipac.eu/

FACCE-JPI: https://www.faccejpi.com/

JPI OCEANS Toolkit: http://www.jpi-oceans.eu/knowledge-hubs-0

MACSUR: http://macsur.eu/

(4) Interviews

Dr. Floor Brouwer: MACSUR Coordinator of TradeM, Wageningen UR, LEI

Dr. Martin Köchy: MACSUR Manager of the Knowledge Hub, Thünen Institute, Institute of Market Analysis

Dr. Pierre Martre: Researcher participating in MACSUR CropM Theme, French National Institute for Agricultural Research (INRA)

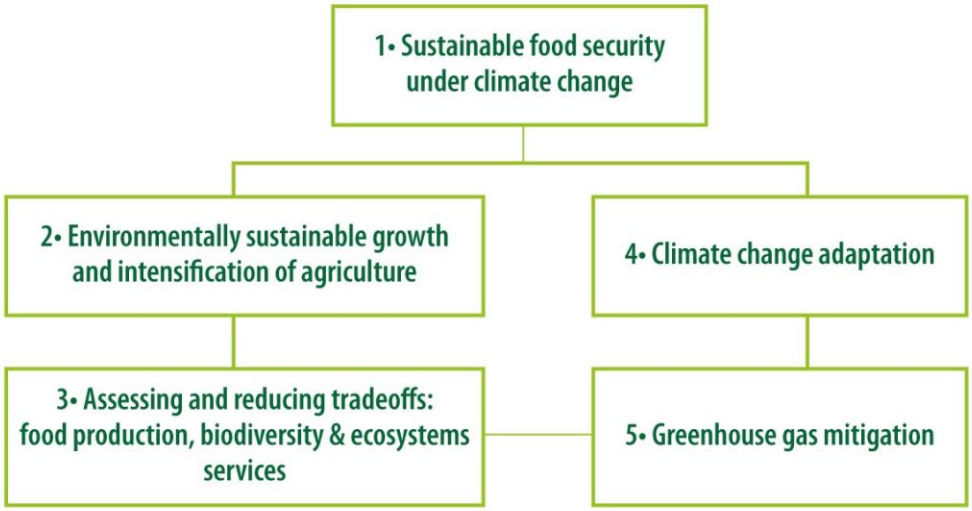
Dr. Klaus Mittenzwei: Researcher participating in MACSUR TradeM Theme, Norwegian Institute for Bioeconomy Research (NIBIO)

ANNEX 1. JOINT PROGRAMMING INITIATIVE ON AGRICULTURE, FOOD SECURITY AND CLIMATE CHANGE[16]

The Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) was among the first JPIs to be launched by the European Council (October 2010). This initiative brings together **22 countries** that are committed to building an **integrated European Research Area** addressing the challenges of agriculture, food security and climate change. Through their representatives on the FACCE-JPI Governing Board, these countries have agreed on a **common vision** to address these major societal challenges. **The JPI is providing coordination** between the member states in their programming of research to achieve the FACCE-JPI vision (see below).

To achieve this goal, a strong **interdisciplinary research** base, encompassing economic and social aspects in addition to scientific ones, is required. This implies the need for a creative approach towards **aligning national programmes**. The interrelated challenges addressed are European and global and require the effort of multiple actors and stakeholders at regional, national and European levels. Input is provided by policy makers, the scientific community as well as stakeholders. The latter provides the JPI with advice through their representatives in the **Stakeholder Advisory Board**.

To respond to the interconnected challenges of sustainable agriculture, food security and impacts of climate change, the **Strategic Research Agenda** of FACCE-JPI includes five evidence-based interdisciplinary Core research Themes (CT) proposed by the Scientific Advisory Board:



This Strategic Research Agenda has been designed to set out clear **policy-relevant research priorities** on agriculture, food security and climate change in Europe, and to list the strategic actions involved to achieve these goals and align current and future national research programmes.

FACCE-JPI seeks to mobilize the research community across Europe to work together to meet the grand societal challenges by:

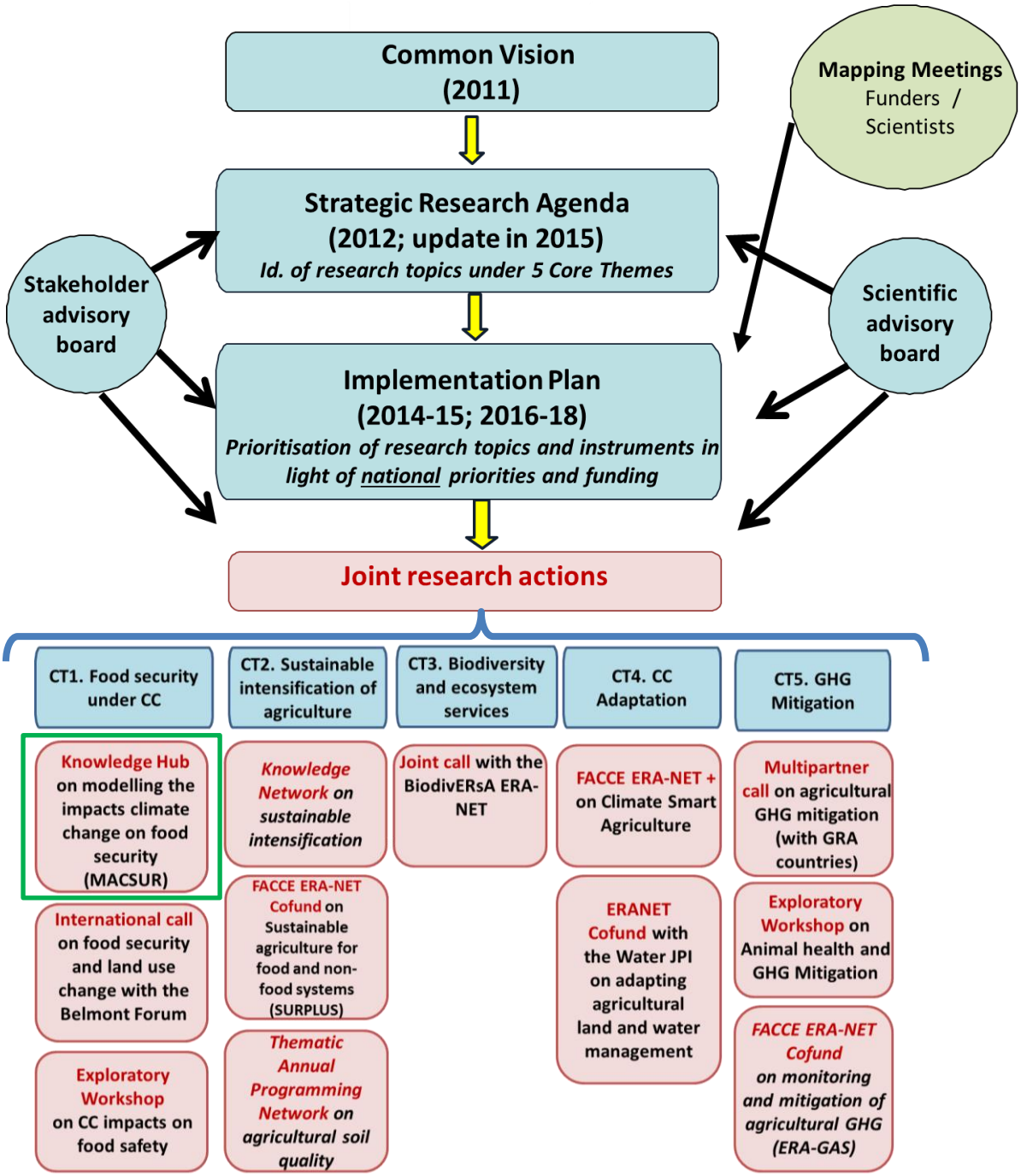
- **Improving the alignment of national and European research programmes,**
- **Increasing high quality transnational research activities within food security, agriculture and climate change, and**
- **Improving European research' societal impact on the challenge of food security, agriculture and climate change.**

FACCE-JPI VISION: *An integrated European Research Area addressing the challenges of Agriculture, Food Security and Climate Change to achieve sustainable growth in agricultural production to meet increasing world food demand and contributing to sustainable economic growth and a European bio-based economy while maintaining and restoring ecosystem services under current and future climate change.*

[16] FACCE-JPI Strategic Research Agenda (2016)

FACCE-JPI MISSION: *to achieve, support and promote integration, alignment and joint implementation of national resources in Europe under a common research strategy to address the diverse challenges in agriculture, food security and climate change.*

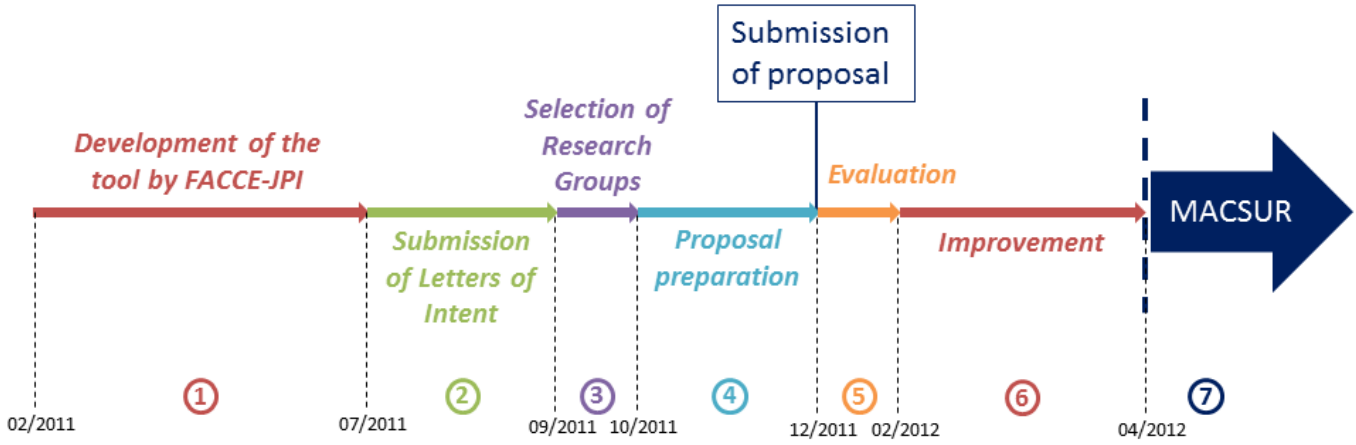
FACCE-JPI IMPLEMENTATION PROCESS:



ANNEX 2. STEPS INVOLVED IN THE IMPLEMENTATION OF MACSUR1[17]

FACCE-JPI developed the Knowledge Hub tool in order to respond to the main scientific challenges identified in Core Theme 1 of its Strategic Research Agenda "Sustainable food security under climate change", i.e. regarding the need in modelling the potential impacts of climate change on the agriculture and food chain and the expected effects of adaptation and mitigation scenarios at all levels, from the production system to processing activities and consumer demand.

The MACSUR Knowledge Hub was implemented in approximately 14 months from the development of the tool by FACCE-JPI to the official start of the project after approval and improvement of the proposal.



① Preparation and development of the Knowledge Hub tool (beginning of February to mid-July 2011)

The Knowledge Hub tool was built based on the model of the network of Nordic Centres of Excellence: it is designed to facilitate transnational cooperation between excellent researchers in a particular field of research, strengthen the European research capacity in this given field and increase its visibility and societal influence, in particular by providing political advice. MACSUR pools together on-going research activities and resources across Europe by selecting research groups which are already active in the field of modelling agri-food systems in the face of climate change and by developing a joint research agenda.

② Launch of applications (mid-July to beginning of September 2011)

Research Groups which applied to be part of the FACCE-JPI Knowledge Hub were to submit a Letter of Intent online, which demonstrated their scientific excellence in the targeted area of research and described their research capacities and infrastructures to be engaged towards the Knowledge Hub.

③ Selection of Research Groups (beginning of September to mid-October 2011)

The selection process was carried out at a national level based on the criteria of research excellence and capacity building potential. The list of selected Research Groups was then confirmed by the Steering Committee.

④ Proposal preparation and submission (mid-October to mid-December 2011)

This phase started with the first networking meeting which gathered all partners in order to reflect on the Knowledge Hub's structure and management: in particular, they voted for the Themes' coordinators and started the drafting of the workplans). Two other meetings were then held amongst coordinators in order to determine the final list of coordinators and finalize the proposal which was submitted mid-December 2011. Concerning the requested funding, the types of eligible costs varied greatly amongst funding agencies/ministries and could cover:

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[17] Tinois, N. (2012). Presentation "*Joining Forces in Europe: Agriculture, Food Security and Climate Change - FACCE-JPI Knowledge Hub*", September 2012.

- Contribution to costs of the Main Coordinator and Theme-Coordinators;
- Travel costs for attending Knowledge Hub meetings;
- Communication and dissemination costs (workshops, newsletters, etc.);
- Training and capacity building (seminars, summer schools etc.) and mobility; and
- Research costs (e.g. staff and consumables).

⑤ Evaluation Phase (mid-December 2011 to end of January 2012)

The online evaluation was carried out by eight experts of the European Commission, including two members of the Scientific Advisory Board of FACCE-JPI in order to evaluate the proposal in its relevance regarding the objectives of the FACCE-JPI Strategic Research Agenda. 19 criteria were considered, each of them being rated from 1 to 3.

A meeting with the Steering Committee was then organized in order to deliver the evaluation report and discuss the main results including the overall assessment of the proposal, recommendations (e.g. regarding the coordinating team), suggestions for improvement and relevance regarding FACCE-JPI's objectives.

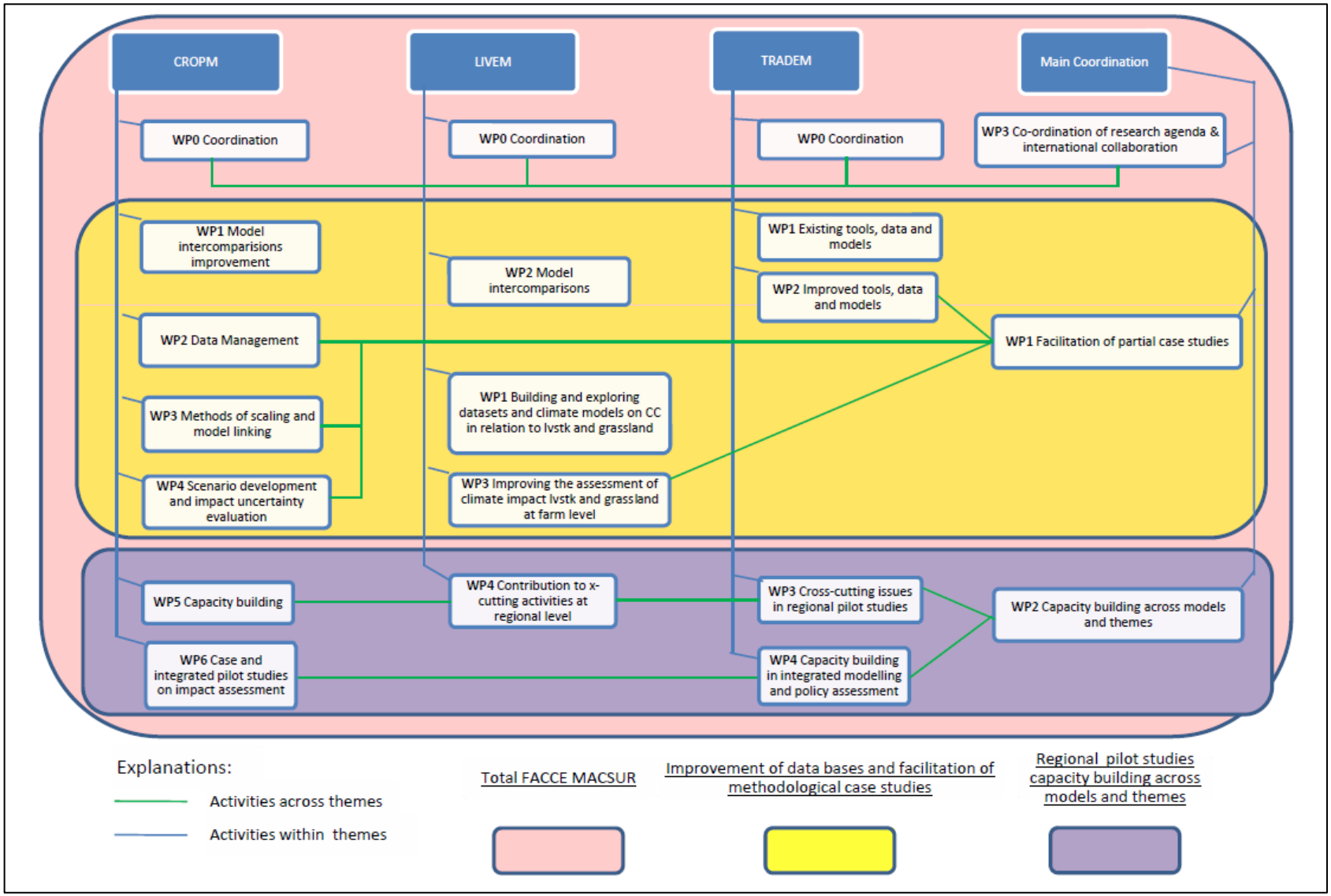
⑥ Improvement Phase (beginning of February to mid-April 2012)

Recommendations were sent to all funders. A meeting between the European Commission and the coordinators was held beginning of March in order to guide their corrections, which were then checked by the European Commission until mid-April.

⑦ Launch of MACSUR (official start July 1st 2012)

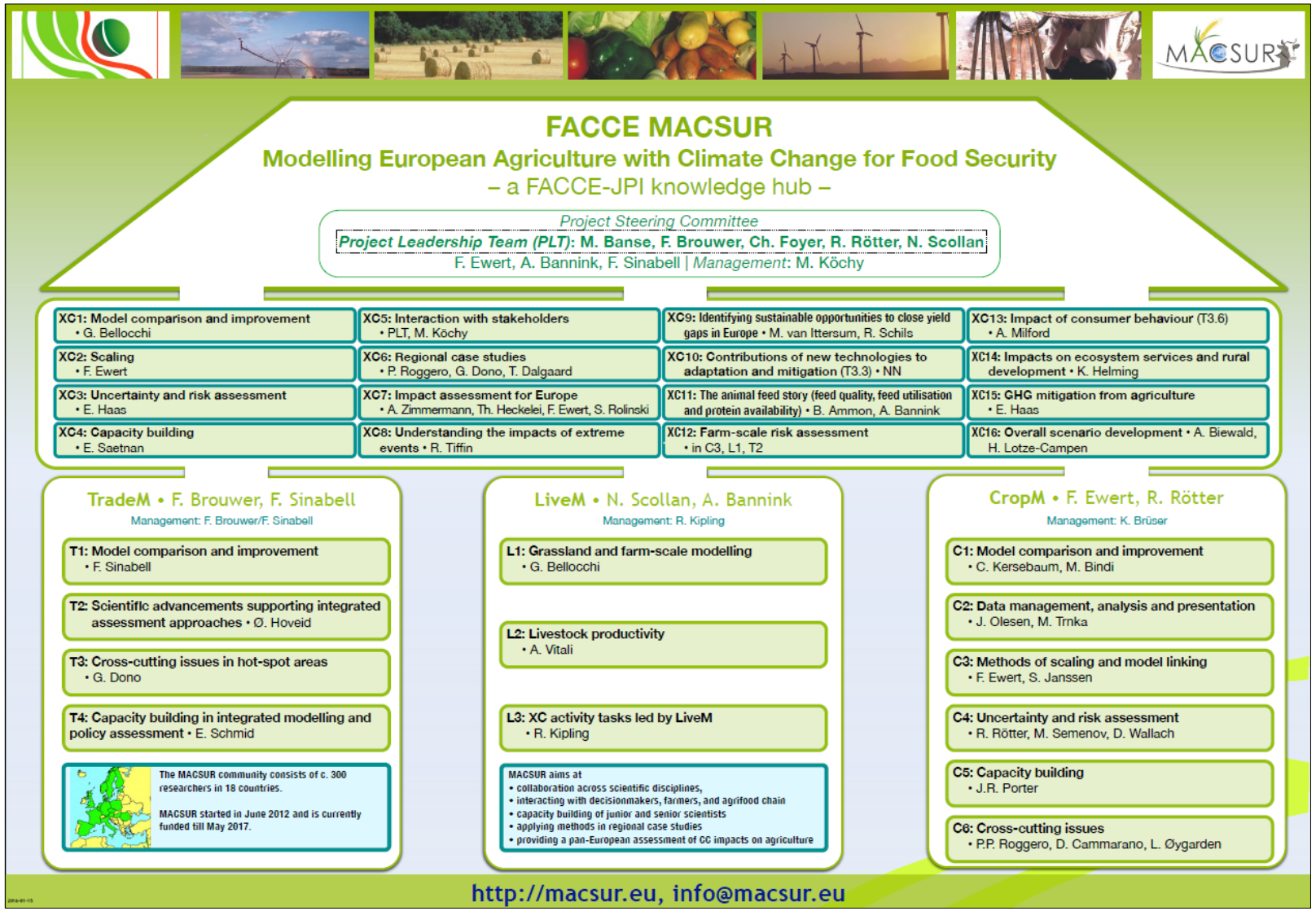
A press release by FACCE-JPI announced the official start of MACSUR while grant agreements could be signed until end of July. The Kick-Off Meeting was held in Berlin on October 15th and 16th.

ANNEX 3. STRUCTURE OF MACSUR1[18]



[18] MACSUR1 Proposal

ANNEX 4. STRUCTURE OF MACSUR2[19]



[19] http://macsur.eu/images/MACSUR_Files/MACSUR%20%20Hub/Information/Poster%20MACSUR2%20Activities%20v2.4.pdf