



Horizon 2020 Call: H2020-INSO-2014

Proposal number: SEP-210134170

Milestone 4.2- Assessment of Current Approaches to Alignment:

Case Study No.6- FACCE JPI Joint Mapping Meetings

Due date of deliverable: April 2016

Actual submission date: September 2016

Dissemination level: Wider public

Lead contractor for this deliverable: INRA

Contributors: MIUR, UNIMAN, AIT



ABSTRACT

This case study examines the key features, methodology and overall strengths and difficulties in implementing an essential step of the Joint Programming Process, namely Joint Mapping of existing and planned national research initiatives in a specific field. The case focuses in particular on the **Joint Mapping exercise conducted in the context of the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI)**. FACCE JPI's mapping methodology relied on **Mapping Meetings**, which brought together delegated national policy, funding and research representatives who exchanged information and views, identified joint programming opportunities and developed a common vision regarding future transnational research priorities. Joint mapping is a **pre-requisite for fostering cross-border alignment at strategic/policy level**, as well as for assessing the potential for financial and operational alignment. While focusing on the specific experience of FACCE JPI, the case study also provides lessons for other public-to-public research partnerships (P2Ps) wishing to develop a similar approach. The case study does however not aim to provide an in-depth assessment of FACCE JPI's joint mapping approach.

The study highlights the benefits of this joint mapping exercise. FACCE JPI's joint mapping provided a **common mapping methodology** to FACCE JPI member-countries, which facilitated the development of an overall picture of national research activities in the FACCE JPI remit (i.e. scientific scope, key players involved and resources provided). This exercise allowed to **identify research gaps and potential synergies** in specific research areas of common interest, and hence to **inform decision-makers of potential transnational strategic priorities** and related research activities to be implemented jointly. Furthermore, mapping meetings relied on a **time-efficient, participatory and interactive** approach, enhancing greater involvement of and ownership by FACCE JPI members. They facilitated networking amongst research and funding/policy experts, and the development of a collective critical analysis of collected mapping data. FACCE JPI used other mapping tools (i.e. desk studies, online surveys, bibliometric analysis) in addition to Mapping Meetings in order to generate comprehensive quantitative and qualitative mapping data. An effective feedback loop and dissemination of the mapping methodology to other P2Ps was also ensured.

Yet, FACCE JPI was also confronted with: (i) the difficulty in achieving a common understanding about the exact scope of the mapping exercise; (ii) heterogeneous information provided by participating countries due to the interdisciplinary scientific scope of FACCE JPI, the diversity of funding agencies and national research programmes and the variable involvement of participants; and (iii) the rapid obsolescence of mapping results, which could be addressed via a regular updating process.

The case study builds on the ERA-LEARN 2020 Task 4.1 ("Definition and Typology of Alignment"), and relies on a review of existing literature and an interview with a member of the FACCE JPI Secretariat who was in charge of facilitating the joint mapping activities. The case is part of a series of nine short case studies that form the basis of the ERA-LEARN 2020 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 approach (strategic, operational and/or financial) that promote alignment, and that are often put in place at different stages of the research programming cycle (planning, strategy, implementation, etc.). The focus of the following case study (i.e. joint mapping) can also be considered as part of the Framework Conditions of Joint Programming, several of which are also analysed in the ERA-LEARN 2020 Task 2.2 ("Support for implementation of Framework Conditions for the JPI community").

ACKNOWLEDGEMENTS

The case study has been written by Madeleine Huber under the supervision of Caroline Lesser from the FACCE JPI Secretariat / Institut National de la Recherche Agronomique (INRA). The author is grateful to Pablo Aller Morán (FACCE JPI Secretariat, former member of the Work Package 2 "Mapping and Foresight for Strategic Collaboration" of the Coordination and Support Action "FACCE-CSA" 2011-2014 / Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, INIA) for his valuable inputs. She would also like to thank the ERA-LEARN Consortium partners for their useful suggestions on earlier drafts of this case study.

Table of contents

1. Introduction	4
2. Key features of FACCE JPI's joint mapping approach	4
2.1 Overview	4
2.2 Methodology.....	5
2.3 Approximate resources and time needed for implementation	7
3. Overall strengths of this approach, including key achievements.....	8
3.1 Development of an essential basis for strategic/policy alignment across countries.....	8
3.2 A time-efficient, participatory and interactive approach	8
3.3 Generation of comprehensive quantitative and qualitative data via the use of various mapping tools .	9
3.4 Effective feedback loop and dissemination of the mapping methodology to other P2Ps	9
4. Overall limitations with this approach, including difficulties encountered during implementation	9
4.1 Difficulty in achieving a common understanding about the exact scope of the mapping exercise.....	9
4.2 Heterogeneity in the information provided by participating countries	10
4.3 Rapid obsolescence of mapping results.....	10
5. Conclusions: Suitability and key factors of success	11
ANNEX 1. EXAMPLES OF NATIONAL POLICY AND RESEARCH POSTERS.....	13
ANNEX 2. THE BREAK-OUT SESSIONS DURING MAPPING MEETINGS	16
ANNEX 3. THE BROAD-BASED CONCLUDING MEETING	18
ANNEX 4. OUTCOMES OF THE MAPPING MEETINGS DISSEMINATION WORKSHOP	20
ANNEX 5. JOINT PROGRAMMING INITIATIVE ON AGRICULTURE, FOOD SECURITY AND CLIMATE CHANGE.....	21

1. Introduction

This case study examines the key features, methodology and overall strengths and difficulties in implementing an essential step of the Joint Programming Process, namely Joint Mapping of existing and planned national (and European) research initiatives in a specific field. The case focuses in particular on the **Joint Mapping exercise** conducted in the context of the *Joint Programming Initiative on Agriculture, Food Security and Climate Change* (FACCE-JPI).

Joint mapping is a **pre-requisite for effective joint programming** and for fostering **alignment at strategic/policy level**. It facilitates the joint elaboration of a Strategic Research Agenda, which is the common base required among countries in order for them to collectively agree on potential areas of cooperation and on joint research actions to be carried forward.

This study assesses how such an approach is best used for promoting greater alignment of national research strategies, programmes and activities. While focusing on the specific experience of FACCE-JPI's mapping activity, the case also provides **lessons for other JPIs and public-to-public (P2P) research networks wishing to develop a similar approach**.

According to the Typology of Alignment, joint mapping is generally carried out by JPI members during the preparatory or research planning phase in order to identify and map on-going and planned national research activities and programmes, and identify research gaps and potential synergies amongst participating countries. This joint analysis mainly involves national policymakers from one or more Ministries as well as representatives from research funding organisations.

2. Key features of FACCE JPI's joint mapping approach

2.1 Overview

The Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) was launched in 2010. It brings together 22 countries¹ and provides coordination support for joint research actions addressing the interconnected challenges of sustainable agriculture, food security and climate change (see Annex 5). FACCE-JPI has identified five Core research Themes which are of high priority to its member-countries:

1. Sustainable food security under climate change (overarching theme)
2. Environmentally sustainable intensification of agricultural systems
3. Developing synergies and reducing trade-offs between food supply, biodiversity and ecosystem services
4. Adaptation to climate change
5. Mitigation of climate change

In order to define potential fields of cooperation and common research priorities, a specific Work Package of the first Coordination and Support Action (CSA) that supported the implementation of FACCE's activities² was focused on the coordination of the mapping of on-going and planned national, transnational and EU research and innovation programmes. This process facilitated the identification of current and expected research synergies, duplications and gaps. In particular, FACCE member countries conducted five mapping exercises over two years (2011-2013), each of them addressing one of the five Core Themes listed above. Their outcomes greatly contributed to the development of FACCE-JPI's Strategic Research Agenda (SRA) and First Biennial Implementation Plan (IP 2014-2015). These so-called *Mapping Meetings* brought together delegated national policy, funding and research representatives in order for them to exchange information and views, identify joint programming opportunities and create a common vision amongst member countries.³

¹ Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Israel, Italy, The Netherlands, Norway, Poland, Romania, Spain, Sweden, Switzerland, Turkey and United Kingdom; New Zealand is an Associate Member.

² WP2 "*Mapping and Foresight for Strategic Collaboration*" of the "FACCE-CSA" 2011-2014

³ Report of FACCE-JPI Mapping and Foresight dissemination activity (February 2014)

2.2 Methodology

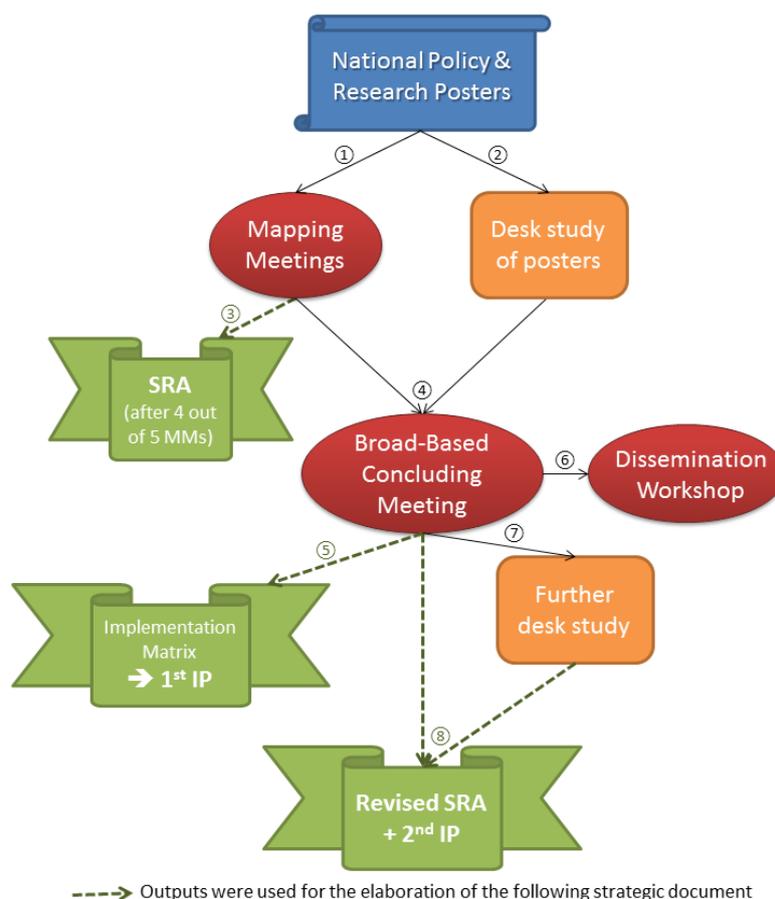
The mapping methodology adopted by FACCE-JPI relied on Mapping Meetings, in addition to other types of mapping activities such as desk studies and surveys. The main objectives of the mapping meetings were to: i) map the current and planned national research programmes and activities in FACCE JPI member countries; ii) identify complementarities, overlaps and gaps in current and future research programs; iii) exchange information regarding current national research policy trends; iv) identify areas where coordination, cooperation and exchanges (of information, people, good practices) had to be improved; v) create a framework for networking and new partnerships; vi) define current perspectives and future/potential research resources available in Europe (funding, facilities and human capital) and vii) suggest priorities for the implementation of joint programming activities.⁴ The key steps involved included (see Fig. 1 below):

- Preparation of national posters;
- Mapping Meetings (MMs) with break-out sessions;
- Desk study of posters.

To conclude and complete this mapping exercise, FACCE member countries carried out three additional activities:

- The Broad-Based Concluding Meeting⁵;
- Further study on policy and funding data collected in national posters⁶;
- The Mapping Meetings Dissemination Workshop⁷.

Figure 1. Main steps involved in FACCE JPI's joint mapping process



Source: Own compilation

⁴ Report of FACCE-JPI Mapping and Foresight dissemination activity (February 2014)

⁵ Reports of the Mapping Meetings and Broad-Based Concluding Meeting are available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>

⁶ FACCE-JPI (2014). Report of FACCE-JPI Mapping and Foresight Further study on Mapping Meetings' Policy & Funding Data.

⁷ FACCE-JPI (2014). Report of FACCE-JPI Mapping and Foresight dissemination activity – Mapping Meetings – Dissemination Workshop.

This mapping approach was novel as it combined data collection and analysis – which included the use of an innovative poster tool compared to traditional surveys and questionnaires – with collective discussions around the collected data for greater involvement of member countries.

Preparation of national posters

Each FACCE-JPI country was asked to fill in two pre-designed posters (see examples of posters in Annex 1):

- The “Policy Poster”, which provided information on the main national research funders, national research and innovation programmes and associated research implementing organisations, and other transnational programmes the country was involved in (e.g. EU projects, JPIs, international programmes);
- The “Research Poster”, which provided information regarding current national research projects and associated research efforts in various agricultural sectors (livestock, crops and/or forestry).

Mapping Meetings with break-out sessions

Each Mapping Meeting lasted two days and focused on one specific FACCE Core Theme. It gathered the national policy and research experts who had completed the posters. Break-out sessions were organised in order to analyse and compare national posters (see Annex 2). They were then concluded by a final discussion during which experts jointly presented and refined recommendations on (i) research priorities to be addressed jointly via FACCE-JPI and (ii) associated joint research actions and tools to be implemented.

Desk study of research posters

After each mapping meeting, a desk study was conducted on the data collected in the research posters. This enabled a more quantitative approach in order to confirm research gaps, overlaps and complementarities identified during the meetings and potentially identify new ones.

Moreover, a bibliometric analysis was carried out for the first Mapping Meeting in order to support the latter’s outcomes with the results of a more traditional methodology.

The Broad-Based Concluding Meeting

This final meeting provided an overall vision of the five Mapping Meetings and helped member countries jointly develop concrete contributions for the elaboration of the First FACCE-JPI Biennial Implementation Plan, which listed the priority joint actions to be carried out during 2014-2015 – and the updated version of the Strategic Research Agenda. In particular, an Implementation Matrix was developed as a major input towards the FACCE-JPI Implementation Plan. It distinguished between three categories of research areas/topics:

- (1) Mature research areas, where further alignment and consolidation would be warranted;
- (2) Emerging research subjects requiring the implementation of joint exploratory and scoping work;
- (3) Research areas where there was a need for new European research, and which could benefit from the joint use of funding instruments for collaborative projects, ERA-NETs and joint infrastructures.

During the Broad-Based Concluding Meeting, discussion sessions took place to address cross-thematic issues (regional aspects, scale and chain, end-users, open data access and standardization) and the three categories of the Implementation Matrix. Moreover, a “stickers session” enabled participants to indicate the support of their country/institution to specific research areas by placing stickers within the Implementation Matrix’s categories (see Annex 3 for more information). An associated desk study was hence able to provide a broad picture of the main priorities and needs of participating countries.⁸

Further study on policy and funding data collected in national posters

A complementary study was carried out after the Mapping Meetings. It provided a more in-depth analysis of the information collected in the policy posters country by country. It also evaluated the answers of FACCE countries

⁸ Report of FACCE-JPI Mapping and Foresight – Broad-Based Concluding Meeting (June 2013)

to an online survey which referred to current as well as future research funding scenarios.⁹ The outcomes of this study were taken into account in the updated version of FACCE JPI’s SRA published in December 2015.

The Mapping Meetings Dissemination Workshop

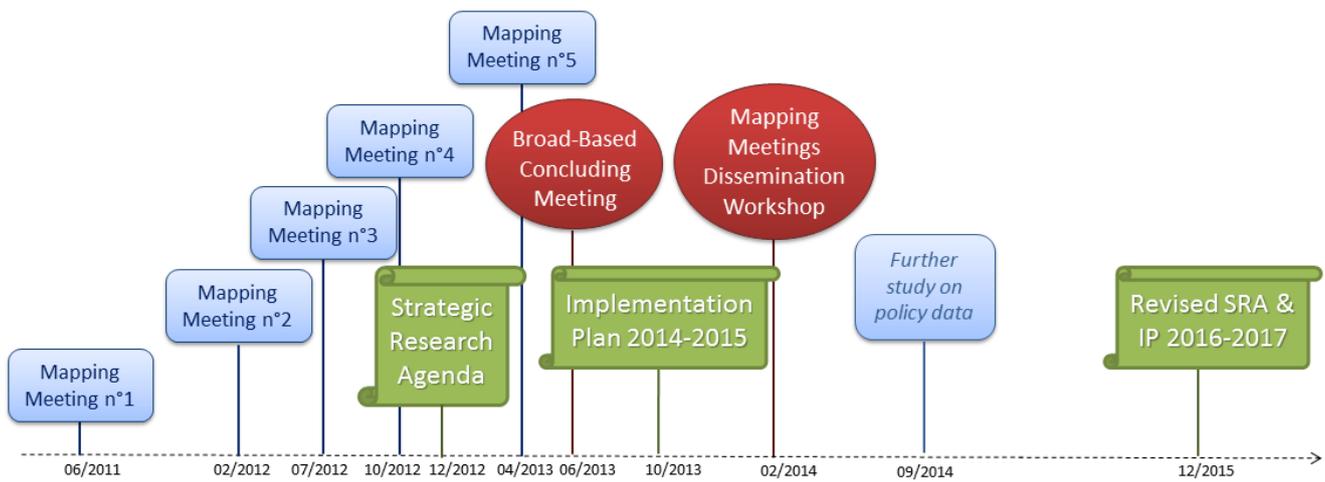
This dissemination event brought together representatives from eight JPIs. It was organised by FACCE JPI in order to share the Mapping Meeting concept and methodology with other JPIs, identify best practices in order to conduct mapping and foresight activities and discuss the various mapping tools and approaches used by JPIs (see outcomes of the workshop in Annex 4).

2.3 Approximate resources and time needed for implementation

The joint mapping activity implemented by FACCE JPI was financially supported by the EC’s first Coordination and Support Action (FACCE-CSA) and members’ own budgets.¹⁰ In terms of human resources, each of the mapping meetings, including the Broad-Based Concluding Meeting, required an average of 3.5 Person-Months in order to prepare and execute the mapping meeting and analyse its results. Hence, the total effort performed over two years between 2011 and 2013 (see Fig. 2) was of 21 PM. In addition, the Mapping Meetings Dissemination Workshop and the Further Study on policy and funding data required 3.5 PM, leading to a total of 24.5 PM over three years and four months.

As illustrated above in Figure 1, the outcomes of the first four Mapping Meetings contributed to the development of FACCE JPI’s Strategic Research Agenda published in 2012. The last Mapping Meeting and the Broad-Based Concluding Meeting provided inputs towards the elaboration of the First Biennial Implementation Plan. Moreover, the additional desk study conducted in September 2014 fed into FACCE JPI’s updated SRA and Second Biennial Implementation Plan (2016-2018), both published in December 2015. Mapping Meeting n°1 focused on FACCE Core Theme “Mitigation of climate change”; Mapping Meeting n°2 on “Adaptation to climate change”; Mapping Meeting n°3 on “Developing synergies and reducing trade-offs between food supply, biodiversity and ecosystem services”; Mapping Meeting n°4 on FACCE JPI’s overarching Core Theme “Sustainable food security under climate change” in order to provide appropriate inputs towards the Strategic Research Agenda; and Mapping Meeting n°5 on “Environmentally sustainable intensification of agricultural systems”.

Figure 2. Timeline for implementation



Source: Report of FACCE-JPI Mapping and Foresight dissemination activity (February 2014), Interview

⁹ Further study on Mapping Meetings’ Policy & Funding Data in view of the Implementation Plan 2014-2015 (September 2014)

¹⁰ Each Mapping Meeting, including the Broad-Based Concluding Meeting, had an average cost of 5.500€ (excluding personal costs). The costs related to the Mapping Meetings Dissemination Workshop were lower as the event lasted only one day and gathered fewer participants. The total cost of these events amounted to approximately 35.000€ (excluding personal costs).

3. Overall strengths of this approach, including key achievements

The innovative mapping methodology developed and implemented by FACCE-JPI provided fundamental prerequisites for further alignment at strategic, financial and operational levels. It relied on a participatory approach consisting of mapping meetings, complemented by other mapping instruments (i.e. desk studies, online surveys and bibliometric analysis).

3.1 *Development of an essential basis for strategic/policy alignment across countries*

The implementation of a mapping activity is a necessary precondition for identifying potential areas of research where joint actions can be developed. Its outcomes form an **overall picture of current national research activities** and highlight potential synergies and existing research gaps. Joint mapping can be considered as an alignment activity in itself as it facilitates the agreement on and joint establishment of a **common framework for mapping research activities at national level**. In FACCE-JPI's case, the format of the posters had been designed and adapted after each Mapping Meeting to collect relevant and targeted information for the mapping objective.

Mapping outcomes provide practical information regarding current research activities (i.e. main national funders and research institutes, national research programmes and allocated budgets, human and financial resources invested per research area at national level, etc.). The latter complements strategic visions developed thanks to foresight activities¹¹, allowing participating countries to collectively make informed decisions regarding future transnational research priorities. For instance, in FACCE JPI's case, the stickers' session which took place during the Broad-Based Concluding Meeting enabled a collective prioritisation of research areas to be addressed through FACCE-JPI. This last meeting provided **direct inputs for joint strategic documents (SRA and IP 2014-2015)**. Thus, mapping can be considered as the first strategic alignment activity in the joint programming cycle when given a broader objective (i.e. agreement on common research priorities and joint research actions) than mapping in its stricter definition. It is a **necessary step for further alignment at strategic/policy level, as well as at financial and operational levels** as it allows to identify financial and scientific resources available across countries.

3.2 *A time-efficient, participatory and interactive approach*

FACCE-JPI's mapping approach relied on the development of an innovative Mapping Meeting tool. The first advantage of such a tool is its **time efficiency**: as meeting dates are fixed, results are obtained within a short period of time, for instance compared to a more typical approach with the use of questionnaires which can trigger delays if waiting for responses. Countries which had agreed to participate in mapping meetings first showed their interest in a joint mapping process and hence understood the need to provide the required information in time for the mapping meeting in order to be able to effectively elaborate the latter's expected outcomes. However, if no recent data is available regarding current knowledge status and national research strategies, foresight activities and the distribution of a more exhaustive questionnaire amongst a large number of scientists, funding providers and stakeholders may be required before implementing more targeted mapping activities such as Mapping Meetings.

More importantly, **the mapping meeting approach allows to spur a dialogue and a first collaboration amongst member-countries, providing a networking opportunity amongst participating scientists on the one hand, amongst funders/policy-makers on the other hand, and between both groups**. Mapping Meeting reports indicate the enthusiasm that participants showed during the meetings, illustrating their strong desire of involvement in this mapping approach. The Break-out sessions gave way for a critical analysis of the information collected in the mapping posters that was jointly led by countries (see Annex 3 for more information). The **active participation of two types of national representatives** (policy-makers/funding providers and scientists) ensured the quality of the information provided by combining perspectives on (i) national strategic research priorities, (ii) financial resources provided to support them and (iii) their operational implementation at the institutional level. Moreover, the inputs of these national representatives allowed an effective identification of possible alignment

¹¹ The Steering Committee on Agricultural Research's (SCAR) joint foresight reviews provided initial inputs towards the development of a common vision amongst FACCE JPI members.

actions across countries. These actions were considered to be addressing common research priorities and at the same time to be feasible at the operational level.

3.3 Generation of comprehensive quantitative and qualitative data via the use of various mapping tools

As highlighted in the Section 2.2, FACCE-JPI's methodology did not only rely on the outcomes of the mapping meetings alone:

- Desk studies conducted with the data provided in the national policy and research posters gave **quantitative results regarding research gaps, overlaps and complementarities**;
- The survey launched after all five mapping meetings allowed to know more about aspects that had not yet been discussed, such as **future national trends** of policy support in FACCE JPI research areas;
- The bibliometric analysis led for the first mapping meeting provided **quantitative and high quality information concerning past trends in research** at institute, country, discipline and publication levels, hence completing findings of other mapping tools on current and potential trends.¹²

By combining various types of mapping instruments, FACCE-JPI was able to generate comprehensive results, which were used as direct inputs for strategic documents (SRA, IP).

3.4 Effective feedback loop and dissemination of the mapping methodology to other P2Ps

The design of mapping meetings was a **"learning by doing" process**. FACCE-JPI developed an evaluation procedure applied during the first mapping exercise in order to use the lessons learned for the following mapping meetings. A technical group was established before this first meeting in order to develop an evaluation methodology. **Observers** who had attended the first meeting gave their feedback concerning the mapping process, in addition to the answers provided by the questionnaire that was circulated to all participants. In particular, this enabled to improve the poster formats provided for the 4th and 5th Mapping Meetings compared to the first Mapping Meetings. Moreover, meeting reports were elaborated shortly after the meetings in order to disseminate and analyse the meeting outcomes. This "learning by doing" approach also allowed to identify missing information that had not been provided during the Mapping Meetings. Therefore, the last deliverable published by FACCE-CSA WP2 consisted in an additional desk study that was conducted in order to collect more policy data.

Furthermore, the **Mapping Meetings Dissemination Workshop** was also part of the evaluation process as it enabled to identify best practices to conduct joint mapping activities. It succeeded in disseminating the Mapping Meeting methodology¹³ and comparing it with other approaches adopted by JPIs. This event was hence not only valuable for FACCE JPI, but also for other JPIs who were then able to use the outcomes of the workshop and adapt them to their own mapping requirements.

4. Overall limitations with this approach, including difficulties encountered during implementation

Achieving reliable mapping results highly depend on the definition process of the research topics addressed and the quality of the information collected. Moreover, mapping results are only up-to-date and valid for a certain period of time, which raises the question of their updating.

4.1 Difficulty in achieving a common understanding about the exact scope of the mapping exercise

The research topics listed on national posters varied largely across countries, showing a diverging understanding of the exact scope of each FACCE JPI Core Theme. For instance, some national research programmes could relate to several research areas at the same time such as climate change mitigation and adaptation. On the other hand, a lack of information regarding precise objectives of other research programmes or projects triggered difficulties in attributing them to a specific Core Theme, as FACCE Core Themes can be considered as very broad and with

¹² First FACCE-JPI Mapping Meeting Report (June 2011)

¹³ The Report of the Mapping Meetings Dissemination Workshop provides an overall description of FACCE JPI's mapping approach and related benefits.

overlapping boundaries. Hence, discussions among participants were necessary in order to clearly define the scope and boundaries of each Core Theme and the research topics they each covered.

4.2 Heterogeneity in the information provided by participating countries

Mapping results highly depend on what has been precisely mapped, how it has been mapped and what level of detail was required. Regarding the first Mapping Meeting, some participants considered that the pre-formatted posters did not allow the collection of sufficiently detailed information and that the time given during the meetings was too short to carry out a complete analysis of the posters.¹⁴ This feedback was taken into account in order to improve the poster and workshop format for following Mapping Meetings (see Section 3.4 above).

Moreover, for FACCE-JPI and more generally for all joint programming initiatives and other public-to-public networks addressing broad challenges, their broad scope may diminish the quality of mapping results. Indeed, the wealth of information collected during the FACCE mapping exercise and its lack of comparability across countries hindered the joint development of a clear overall view and comparison of national research activities undertaken in the FACCE-JPI remit. In particular, although the format of policy posters had been designed to collect relevant and targeted information, the data provided was hard to analyse due to the **heterogeneity and diversity of funding agencies and national research programmes**.¹⁵ The collection of accurate and complete sets of data highly depended on the active involvement of participants. This is indeed crucial for a collaborative exercise such as Mapping Meetings as they require a time-consuming procedure that implies a large number of people and aims to collect numerous data. Hence, as explained in Section 2.2, additional desk work was required in order to analyse outcomes of the mapping meetings and collect missing information.

4.3 Rapid obsolescence of mapping results

Mapping is an essential step in the Joint Programming process to understand in which research areas national research programmes can be coordinated and aligned. Thus, it is fundamental to have access to the most recent information concerning current research activities and national priorities. Knowing that research projects are in constant evolution, mapping results obtained at a precise moment will be quickly outdated, which is a difficult challenge for joint programming. This evolving reality implies a necessary regular updating of the joint Strategic Research Agenda (or other joint strategic documents), and hence a regular – if not continuous – mapping of national (and European) research activities.¹⁶ This guarantees the relevance of joint programming over time. Mapping Meetings may not be most suited for regular/continuous monitoring of research activities and outcomes as they require a complex organisation, which may be burdensome to implement on a frequent basis. Appropriate tools for the updating of mapping results would require a more manageable operation (e.g. partially automated) and provide outputs that can easily be taken into account in the short-term timeframe of the Joint Programming cycle (e.g. contribution towards Implementation Plans).

¹⁴ First FACCE-JPI Mapping Meeting Report (June 2011)

¹⁵ Further study on Mapping Meetings' Policy & Funding Data in view of the Implementation Plan 2014-2015 (September 2014)

¹⁶ Report of FACCE-JPI Mapping and Foresight dissemination activity (February 2014)

5. Conclusions: Suitability and key factors of success

Joint mapping is an essential first step in the Joint Programming cycle. It allows participating countries to collectively agree on a common mapping framework of national research activities. It also facilitates alignment at **strategic/policy levels** through the identification of research gaps and possible synergies across countries, and subsequently facilitates agreement on common research priorities to be addressed jointly (via a common SRA and IP). Moreover, it also assesses the **potential for financial and operational alignment** through the mapping of funding and scientific resources. Mapping outcomes have to be integrated in a decision-making process. Hence, a joint mapping procedure is **crucial at the beginning of any type of joint programming initiative and should also be carried out on a regular basis** for the updating of mapping results and the adaptation of joint activities if necessary. It can also be implemented continuously if its objective is an accurate monitoring of research activities across countries.

Key factors of success:

1) At strategic level:

- **Clearly define the objective of the mapping exercise** according to beneficiaries, the nature of expected outcomes (e.g. monitoring database, inputs towards a Strategic Research Agenda) and the associated type of information needed. The geographical scale should also be taken into account: for instance, carrying out a mapping at national level enables the provision of more detailed information; integrating global issues and the mapping of research activities outside Europe can also promote international collaboration.
- **Clearly define the scientific scope of the mapped research activities:** according to the objectives of the mapping exercise and the level of detail required, a broad mapping can be carried out at the level of the overall theme of a JPI. An alternative approach can be the division of this overall theme into several smaller sub-themes and a mapping at this scale (as was done for FACCE-JPI).

2) At operational level:

- **Implement a participatory and interactive mapping approach** involving various experts and stakeholders: the participation of qualified participants (especially scientific, policy and funding experts, as well as end-users and the private sector when deemed relevant in the identification of transnational research needs) allows for a higher quality and a greater amount of collected information (e.g. in mapping posters) and mapping results after joint analysis and discussion (e.g. during mapping meetings). A participatory approach is of high value for further alignment as it enhances the involvement of and ownership by member-countries and aims to facilitate the joint elaboration of inputs towards a common Strategic Research Agenda and the collective identification of potential joint actions.
- **Foster an active involvement of participants:** this is crucial for the implementation of a collaborative mapping process as it ensures to collect the data required in order to effectively identify research gaps and potential synergies among participating countries.
- **Combine different mapping instruments** in order to obtain comprehensive information: instruments should be carefully chosen according to the research area and the ambition of the mapping exercise. The main tools used for mapping can be questionnaires, surveys, mapping meetings, bibliometric research, analysis of national data, literature review and targeted interviews. The choice of tools should be supported by specialists who can provide useful inputs regarding the methodology and the type of information to ask for.
- **Ensure a high quality coordination, facilitation and evaluation of mapping activities** with professional help if needed.
- **Ensure effective procedures to take account of mapping outcomes in joint strategic and operational JPI documents:** giving a broader and more strategic objective to the mapping activity (e.g. by providing direct inputs for a Strategic Research Agenda) enables an efficient link between the mapping of current activities and the identification of potential research areas to be addressed through joint actions.
- **Renew joint mapping activities as often as necessary** or as a continuous process in order to monitor new national research activities and programmes.

REFERENCES

Literature

- FACCE-JPI (2011). *Report of FACCE-JPI Mapping and Foresight on Mitigation of agricultural greenhouse gas-induced climate change – Mapping Meeting 1 June 20-21, 2011*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2012). *Report of FACCE-JPI Mapping and Foresight on Adaptation of Agriculture to Climate Change – Mapping Meeting 2 February 22-23, 2012*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2012). *Report of FACCE-JPI Mapping and Foresight on Assessing and reducing trade-offs: food production, biodiversity and ecosystem services – Mapping Meeting 3 July 11-12, 2012*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2012). *Report of FACCE-JPI Mapping and Foresight on Sustainable food security under climate change – Mapping Meeting 4 October 17-18, 2012*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2012). *Summary of Conclusions and Recommendations. FACCE-JPI Mapping Meeting on Core Theme 1 of the Research Agenda “Sustainable food security under climate change”*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2012). *Strategic Research Agenda*. Available at: <https://www.facejpi.com/Strategic-Research-Agenda>
- FACCE-JPI (2013). *Report of FACCE-JPI Mapping and Foresight on Environmentally sustainable growth and intensification of agriculture – Mapping Meeting 5 April 10-11, 2013*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2013). *Synthesis of Mapping Meetings 1 – 5*.
- FACCE-JPI (2013). *Report of FACCE-JPI Mapping and Foresight – Broad-Based Concluding Meeting 24th June 2013*. Available at: <https://www.facejpi.com/Document-library/Mapping-meeting-reports>
- FACCE-JPI (2013). *First Biennial Implementation Plan 2014 – 2015*. Available at: <https://www.facejpi.com/Strategic-Research-Agenda/FACCE-JPI-Implementation-Plan>
- FACCE-JPI (2014). *Report of FACCE-JPI Mapping and Foresight dissemination activity – Mapping Meetings – Dissemination Workshop*.
- FACCE-JPI (2014). *Report of FACCE-JPI Mapping and Foresight Further study on Mapping Meetings’ Policy & Funding Data*.
- FACCE-JPI (2015). *Strategic Research Agenda – Revised edition, 2016*. Available at: <https://www.facejpi.com/Strategic-Research-Agenda>

Posters

- FACCE-JPI (2012). *Stocktake of current research on Adaptation to Climate Change, Denmark – National research poster for Mapping Meeting 2*.
- FACCE-JI (2012). *Policy information: Programmes on Adaptation to Climate Change, Denmark – National policy poster for Mapping Meeting 2*.
- FACCE-JPI (2013). *Matrix on Implementation – Posters for Broad-Based Concluding Meeting, 24 June 2013, Copenhagen*.

Consulted websites

FACCE-JPI: <https://www.facejpi.com/>

Interview

Pablo Aller Morán: FACCE JPI Secretariat (Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria)

ANNEX 1. EXAMPLES OF NATIONAL POLICY AND RESEARCH POSTERS

Before each mapping meeting, FACCE member-countries were responsible for the mapping of their own national research programmes and activities. According to the decision of FACCE-JPI's Governing Board, they each designated national science and policy delegates who were in charge of filling out the pre-formatted mapping posters designed by the Work Package 2 "*Mapping and Foresight for Strategic Collaboration*" of the FACCE-Coordination and Support Action.¹⁷

National policy posters:

As illustrated below with the example of Austria, policy poster provide background information on national research policies, and funding organisations and programmes as well as research performing organisations related to the addressed Core Theme. European and international partnerships are also mentioned in order to map current transnational research programmes.

National research posters:

Main national research projects are listed in order to identify research gaps and complementarities when comparing all national research posters. For most of the Core Themes, research posters list projects per sector (e.g. plant production, animal production, forestry) and projects dealing with horizontal aspects such as socio-economic issues, regionalisation, infrastructures and sustainability. National research efforts were estimated per sector with the total number of national projects, the amount of funding provided and the number of person months per year in order to have comparable figures across countries.¹⁸

The posters provided below give an illustration of the content of a policy poster (first poster) and a research poster (second poster). These were drafted by the delegates of Austria for the 5th Mapping Meeting, dealing with Core Theme 2 "*Environmentally sustainable growth and intensification of agriculture*".¹⁹ The format of the posters was improved after the first Mapping Meetings, which is why they were more refined and relevant for the 4th and 5th Mapping Meetings.

¹⁷ Report of FACCE-JPI Mapping and Foresight dissemination activity (February 2014)

¹⁸ First FACCE-JPI Mapping Meeting Report (June 2011)

¹⁹ Second FACCE-JPI Mapping Meeting Report (February 2012)



POLICY & FUNDING INFORMATION: Environmentally sustainable growth and intensification of agriculture

AUSTRIA



BOX 1		NATIONAL FUNDERS			
Main National Funders on research, innovation and knowledge transfer on the addressed area (Ministries, Agencies, Councils or Private stakeholders).					
Names of main National Funders (for agencies and councils indicate the Ministry they are related to)		Contact details			
<ul style="list-style-type: none"> Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) Federal Ministry for Science and Research (BMWF): basic funding of universities, of the Austrian Science Fund (FWF), and the Austrian Academy of Sciences (OAW) Federal Ministry for Transport, Innovation and Technology (BMVIT) Federal Ministry of Economy, Family and Youth (BMWFJ) Austrian Research Funding Association (FFG): budget from BMVIT and BMWFJ Austrian Science Fund (FWF): affiliated to BMWF; bottom-up principle 		<ul style="list-style-type: none"> Organisation: BMLFUW Contact person: Elfriede Fuhrmann, Maria Keuschnigg e-mail: elfriede.fuhrmann@lebensministerium.at; maria.keuschnigg@lebensministerium.at Website: www.lebensministerium.at 			
BOX 2		NATIONAL PROGRAMMES AND SUB-PROGRAMMES (P & sP)			
Main National Programmes/Sub-programmes (P & sP) on research, development and innovation dealing with the area here addressed. If there are P & sP on knowledge transfer and diffusion of results please indicate them as well.					
Number P & sP	Names of main P & sP	Estimated budget and funding allocated to sustainability/intensification of agriculture in these P & sP (last 3 years)	Main organisations involved on research		
<ul style="list-style-type: none"> P: 2 sP: 	<ul style="list-style-type: none"> P: PFEIL 15 – Programme for Research and Development of the Ministry of Life (previous programmes: PFEIL 05 & PFEIL 10) budget & administration: BMLFUW; ongoing programme P: COMET – Competence Centres for Excellent Technologies; budget: BMVIT and BMWFJ, administration: FFG; ongoing programme 	<ul style="list-style-type: none"> Budget PFEIL 15 (& 10) for contract research, and research funding in the range of agriculture, forestry, environment, water management in general: 11 mio €; Funding allocated to sustainable intensification: 5 mio € contract research & budget allocated to ministry related research institutions Budget for Competence Centre "Future Farm Technology" (FFT): 3.16 mio €; Funding: shared equally between public and private funders 	Universities	Public institutions	Industries, SMEs, NGOs, others.
			<ul style="list-style-type: none"> University of Natural Resources and Life Sciences (BOKU) Vienna University of Technology University of Veterinary Medicine, Vienna University of Innsbruck University of Vienna 	<ul style="list-style-type: none"> Agricultural Research and Education Centre Raumberg-Gumpenstein Austrian Agency for Health and Food Safety (AGES) Gregor Mendel Institute of Molecular Plant Biology (GMI) – founded by Austrian Academy of Sciences (OAW) Agricultural Research and Education Centre Francisco Josephinum – Josephinum Research Austrian Institute of Technology (AIT) Federal Institute of Agricultural Economics (AWI) 	<ul style="list-style-type: none"> Research Institute of Organic Agriculture (FiBL Austria) Bio Austria (agric. extension) ZüchtData EDV Dienstleistungen Seebucht Donaue Seebucht Gledsorf National breeders' associations (cattle, pigs, poultry) Arche Nooth Biohelp Exemplary SMEs – IT & technology: CogVita (spin-off of Vienna University of Technology), Pesti Instruments, Integrated Microsystems Austria, PROGIS Software, Machinery Ring Austria
BOX 3					
INTERNATIONAL COOPERATION					
Projects	Number of projects / initiatives last 3 years	Average budget per project or initiative	Name and acronym (main ones)		Countries in consortium
EU level	FP7 projects	• 20	• € 400.000 (budget AT)	<ul style="list-style-type: none"> Strategies for organic and low-input integrated breeding and management (SOLIBAM) Innovative biological products for soil pest control (INBIOOIL) Robot fleets for highly effective crop management in mediterranean agriculture (RHEA) Meeting the challenges of the farm of tomorrow by integrating Farm Management Information Systems to support real-time management decisions and compliance to standards (FutureFarm) Development of an automatic irrigation and fertilization system (OPTIFERT) 	<ul style="list-style-type: none"> FR, AT, IT, UK, DK, DE, PT, ES, HU, CH, ML, ET, IE, (CARDIA) ES, FR, BE, DE, CH, AT, IT, GR GR, DK, DE, CZ, FI, IT, NL, AT, ES, UK DE, AT, UK, PL
	ERA-NETS	• 4		<ul style="list-style-type: none"> CORE ORGANIC ERA-CAPS EUPHRESCO ANINWA 	<ul style="list-style-type: none"> DK, AT, DE, BE, CZ, EE, FI, FR, IE, IT, LT, LU, NL, NO, SI, ES, SE, CH, TR, UK, LV UK, AT, BE, DE, DK, EE, ES, FR, HU, IL, IT, LV, NL, NO, PL, PT, RS, CA, NZ UK, AT, BE, BG, CZ, DK, EE, FI, FR, DE, GR, IE, IT, LT, NL, PT, SI, ES, CH, TR, UK, RU FR, AT, BE, CY, CZ, DK, FI, DE, GR, IE, IL, IT, LT, NL, NO, ES, SE, CH, UK
Other International Cooperation		<ul style="list-style-type: none"> Average COST action support per annum: € 129.000 Approx. € 8.000 membership fee & intangible services 	<ul style="list-style-type: none"> COST – FA1208: Pathogen-informed strategies for sustainable broad-spectrum crop resistance (starts in April 2013) COST – FA1105: Towards a sustainable and productive EU organic greenhouse horticulture COST – FA1206: Strigolactones: biological roles and applications (starts in April 2013) COST – FA1103: Endophytes in Biotechnology and Agriculture COST – FA0903: Harnessing plant reproduction for crop improvement COST – FA0806: Plant virus control employing RNA-based vaccines: A novel non-transgenic strategy European Cooperative Programme for Plant Genetic Resources (ECPGR) 	<ul style="list-style-type: none"> AT, BE, DK, FR, DE, HU, IL, MT, NL, NO, PL, PT, RO, ES, CH, UK NL, SE, AT, BE, CH, CY, DE, DK, EE, ES, FI, FR, IE, IS, IT, NO, PL, RO, SI, TR, UK AT, BE, HR, CZ, FR, DE, GR, IL, IT, NL, NO, PL, PT, RO, RS, SK, ES, SE, CH, UK DE, UK, AT, BE, BA, CZ, DK, FI, FR, GR, IE, IL, IT, NL, PL, PT, SK, SI, ES, TR IT, BE, AT, BG, CZ, DK, FR, DE, GR, HU, IL, IT, LV, NL, NO, PL, PT, RS, SK, ES, SE, CH, TR, UK GR, CH, AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, HU, IL, IT, NL, NO, PL, PT, RO, RS, SK, SI, ES, SE, TR, UK (COST participants, excl. non-COST participants) 	

				MAPPING OF CURRENT RESEARCH: Environmentally sustainable growth and intensification of agriculture		AUSTRIA 		
Joint Programming Initiative: Agriculture, Food Security and Climate Change	SECTORS	Total Projects (last 3 years)	Total Funding	AREAS	MAIN PROJECTS	Research Effort (Person Month)		
	 PLANT PRODUCTION (cropping systems)	24	8,26 mio. €	Plant genetic resources (breeding / genetics / biodiversity)	<i>Strategies for organic and low-input integrated breeding and management; Variety trials for organic farming; Comparison and adaptation of open pollinating varieties of carrots</i>	34		
Land based innovative cropping systems				Reducing fuel consumption by 20%; Effects of different soil management systems on carbon sequestration; Reduced tillage and green manure	254			
Plant protection				<i>Innovative biological products for soil pest control; Genetic determination of susceptibility to ear fusariosis; Development of Erwinia bacterioides; Copper as plant protection product</i>	113			
Organic farming: low-input – high-efficiency crops				Optimizing the conditions for the production of grain legumes; Long-term monitoring of effects of conversion to organic farming	154			
Organic farming: agro-ecological technologies				Innovative cropping techniques to increase soil health in organic fruit tree crops; Monitoring of diseases on potatoes	64			
Agro-ecological technologies for plant production intensification				Impact of intensive and reduced fertilizing-regimes on site-specific leaching of nutrients in farming systems; Use of beneficials	56			
Remote sensing				---				
Production in greenhouses				---				
 ANIMAL PRODUCTION (incl. grassland)				34	8,29 mio. €	Farm animal genetic resources (breeding / genetics / biodiversity)	Genomic selection across cattle breeds; Optimization of long-term genetic progress of Austrian cattle breeds; Development of genetic evaluations for health traits; Genetic analysis of lifetime production of sows	179
						Land-less management systems	Layer hens kept in alternative husbandry systems; Alternative fish feed	105
	Agro-ecological technologies on farm intensification – Animal production	<i>Sustainable organic and low-input dairying; Strategies to reduce the concentrate input in organic dairy production; Feed intake, milk performance of dairy goats</i>	48					
	Agro-ecological technologies on farm intensification – Grassland	Nutrient flux, forage yields and biodiversity under different grassland management; Phosphorus dynamic in grassland soils; Leaf fertilization on meadows; Improvement of slurry fertilization	133					
	Organic farming: Animal welfare	Strategies to reduce environmental impact by improving health and welfare; Monitoring of health and welfare plans in Austrian organic pig farms; Prevention of diseases and parasites in organic pig herds; Minimizing medicine use in organic dairy herds	150					
	Organic farming: Resource use efficiency	Optimization of the protein supply of dairy cows fed forage-based diets; Alternative protein sources for rearing piglets; Improved contribution of local feed to support 100% organic feed supply to pigs and poultry	66					
 HORIZONTAL ASPECTS	12	5,07 mio. €	Sustainability of agricultural production	Integrative evaluation of ecological, economic and social sustainability aspects in dairy production; Life cycle assessment of Austrian farms	128			
			Sustainable management	<i>Integrating farm management information systems; Automatic irrigation and fertilization system; Robot fleets for highly effective crop management in Mediterranean agriculture; Future farm technology</i>	---			
			Socio-economic aspects	Phasing-out of milk-quotas; Market risk management options for Austrian farms	15			
			Diversification of production systems	Compilation of information regarding underutilized species and varieties	7			

Projects in italics are FP7-Projects, for which we have no information about person-months

ANNEX 2. THE BREAK-OUT SESSIONS DURING MAPPING MEETINGS

Break-out sessions consisted in dividing participants into small working groups in order to analyse the content of national posters. Through the facilitation of moderators, this joint analysis led to:

- the identification of research gaps, overlaps, complementarities and emerging topics;
- the mapping of research facilities;
- and the drafting of recommendations on research topics for joint actions and associated tools which could be implemented.

Each working group combined four to five countries and was composed of research and policy delegates. As mapping meetings lasted two days, the composition of working groups was modified the second day in order to promote a wider analysis and a stronger consensus among participants. Results were collected in a pre-defined template for each working group.

An example of outcome resulting from a break-out session during the third Mapping Meeting is given in Table 1 (Core Theme 3 “Assessing and reducing trade-offs: food production; biodiversity and ecosystem services”).

Table 1. Outcomes of a break-out session of FACCE JPI’s third Mapping Meeting

GROUP 1 - To identify				
Gaps	Overlaps - Complementarities	Synergies	Emerging research topics	Research facilities
Genetic resources & old races with less impact on ecosystem services (ESS). Full chain view: productivity – trade offs (projects generally view a limited scope). General understanding of interactions between farming & ESS + ESS valuation.	Animal welfare. Biodiversity issues in Grasslands and Forestry. Conservation of genetic variation in plants.	ERA-NETs (several). Future crop pests.	Biological soil nutrient extraction (e.g. <i>Mycorrhiza</i> uptake of P). Soil carbon sequestration and Long term soil fertility. Closed cycle concepts in farming – farm and societal scale (industrial symbioses).	No common gene-bank and conservatories. No common or general experimental approach & facilities. No data sharing.
Recommendations				
Research topics for joint actions		Tools to undertake cooperation		Other suggestions
“Closed cycle concepts” thinking and research in food production (from flow to cycle). Long term soil carbon storage and soil fertility conservation.		Transfer recommendations to EU level (e.g. calls in Horizon 2020). Common and coordinated research approaches and experimental infrastructures. Common data and modelling platforms.		

Source: Third FACCE-JPI Mapping Meeting Report (July 2012)

The main outcomes of the five Mapping meetings are summarized below in Table 2. They provided recommendations concerning research themes and tools identified for joint actions and cooperative research. In addition, the summarizing process of all five Mapping Meetings led to the identification of cross-cutting themes: (i) regionalisation, (ii) scale, (iii) food chain approach, (iv) socio-economic and cultural aspects and (v) implementation of new technologies.²⁰

²⁰ Synthesis of Mapping Meeting 1 – 5 (June 2013)

Table 2. Main outcomes of the Mapping Meetings

<i>FACCE Core Theme</i>	<i>Research themes identified</i>	<i>Tools and joint actions suggested</i>
MM1: Greenhouse gas mitigation	<ul style="list-style-type: none"> • Carbon sequestration in crop production • Protocols and certification for methods to assess greenhouse gas emission • Reduction of emissions by livestock • Carbon and nitrogen cycling in the agro-ecosystems • Study of indirect emissions 	<ul style="list-style-type: none"> • Harmonization of modelling efforts • Cooperation with other initiatives • Identification of infrastructures to be shared • Development of tools for judging integrated production systems
MM2: Climate change adaptation	<ul style="list-style-type: none"> • Risks for and adaptation of livestock systems, crop production and forestry • Policies and incentives for sustainable production, transformation and consumption • Water management in agricultural production • Risk assessment of extreme climatic events 	<ul style="list-style-type: none"> • Transnational programmes • Cooperation and sharing (data, infrastructures, methodologies, trainings, mobility) • Regionalisation • Support regulation on adaptation
MM3: Assessing and reducing trade-offs: food production; biodiversity and ecosystem services	<ul style="list-style-type: none"> • Definition and valuation methods of ecosystem services • Assessment of ecosystem services • Interlinking between science and policy • Land sharing versus land sparing 	<ul style="list-style-type: none"> • Networking for data collection and sharing, pooling of expertise • Targeted projects • Trainings • Collaboration with other initiatives
MM4: Sustainable food security under climate change	<ul style="list-style-type: none"> • Study of food chains • Scenario building and modelling • Assessment and influence of consumer behaviour • Land use changes under climate change • Impact assessments of policy instruments • Quantifying and diminishing food waste 	<ul style="list-style-type: none"> • Sharing of financial and scientific resources • Think tank to promote joint actions • Coordination with other UE and international initiatives • Interaction with end-users
MM5: Environmentally sustainable growth and intensification of agriculture	<ul style="list-style-type: none"> • Systemic approach (socio-economic aspects, farm and landscape levels) • Diversification of production • Innovations in plant and animal breeding • Data availability and mutual learning 	<ul style="list-style-type: none"> • Inter-regional networks involving researchers and stakeholders • Joint experimental farming • Open access to genetic resources • Collaborations with other initiatives

Source: Mapping Meeting Reports

ANNEX 3. THE BROAD-BASED CONCLUDING MEETING²¹

The Broad-Based Concluding Meeting took place in June 2013 after the publication of FACCE-JPI's Strategic Research Agenda, in order to provide inputs for the First Biennial Implementation Plan (2014-2015). Two sessions were key to the effective progress of the meeting:

1) 'World Café' discussion session:

After an introduction presenting the state of the art concerning the Implementation Plan as well as the key outcomes of the five Mapping meetings, seven discussion tables were organised:

- Four of them addressed the crosscutting issues identified in the previous mapping meetings (regional aspects, scale and chain, end-users, open data access and standardization), each table dealing with one specific crosscutting issue.
- The three other discussion tables focused each on one of the three categories elaborated for the Implementation Matrix: (1) mature research areas with associated alignment instruments, (2) emerging research subjects requiring the implementation of scoping instruments and (3) areas where there is a need for common European efforts and developing research, which can benefit from the use of funding instruments for collaborative projects, ERA-NETs and joint infrastructures. They enabled the completion of the Implementation Matrix per Core Theme (see below for the example of Core Theme 2 "*Environmentally sustainable growth and intensification of agriculture*"). Common understanding of each research topic was achieved, leading to additional suggestions regarding possible tools to be jointly implemented.

2) 'Stickers session':

A voting system was put in place in order for participants to indicate the support of their country or research organisation to identified research topics in the Implementation Matrix. Three groups were formed:

- The "Policy" groups brought together national representatives of the 19 countries participating in the Broad-Based Concluding Meeting; hence, 19 "Policy" sub-groups could vote.
- The "Science" group was divided in four sub-groups: animal, plant, land use and socio-economic sectors.
- The "Stakeholders" group was divided in three sub-groups: farmers, industry and consumers.

Each sub-group was given one set of votes: a sub-group could vote for three different alignment topics (Category 1), four different emerging topics (Category 2) and 7 different new funding topics (Category 3). A desk study was conducted with the voting results in order to analyse the main research priorities of participants.

²¹ Report of FACCE-JPI Mapping and Foresight – Broad-Based Concluding Meeting (June 2013)

Core theme 2 Environmentally sustainable growth and intensification of agricultural systems

<p>Cat 1. Mature Research ⇒ Alignment instruments including areas where research is scattered ⇒ alignment at geographic or thematic level</p>	<p>Cat 3. Need common European effort and developing research ⇒ Funding instruments, Collaborative projects</p>	<p>Cat 3. Need common European effort and developing research ⇒ Funding instruments, ERA-NETs</p>
<p>2.1.1 Agricultural soil restoration Knowledge Hub. Developing novel methods for restoring organic matter in agricultural soils, reduce erosion and increase soil quality by reducing organic pollutants and heavy metals (e.g. by increasing soil biological activity, through conservation agriculture, crop and grassland rotations, mulch and composts, buffer strips, phytoremediation, etc...). Collaboration with JRC and with FAO, with Snowman network. (2014) <u>Of interest to Plant ETP, support of IPWG, TP O</u></p> <p>2.1.2 Sustainable intensification of major European crop and livestock systems Combined development of breeding (and multiplication of locally adapted seeds and breeds), plant/animal health, agro-ecological engineering, precision farming, ecotechnologies and biotechnologies for increased environmental sustainability, increased feed efficiency, resource efficiency & conservation, productivity and competitiveness in the context of climate change (Link to agricultural EIP. Coordinate efforts across countries with support through long-term funding of >4 years. Knowledge networks, possibly combined later within a single knowledge hub) Research should not only target major crops, but also minor crops to favour crop diversification opportunities. (2015) <u>Priority: Plant ETP, Support of IPWG</u></p> <p>Collaboration with EIP (not funded by FACCE) <i>Research and Innovation Board on environmentally sustainable growth and intensification of agricultural systems. This would be an ongoing discussion and dissemination activity looking at major projects funded at European or Member States levels, to discuss the additional steps needed until it can actually be implemented at the farm level. It could be run by the relevant ETPs to identify, if towards the end of the projects, further basic research or applied research or knowledge transfer or which measures in the innovation framework would be needed to make sure that all projects lead to their implementation at farm level. (2014)</i></p> <p>Collaboration with EIP (not funded by FACCE) <i>Facilitating extension services across Europe to bring the knowledge to the farmers and to give feedbacks from the farmers to the researchers. The implementation would be mainly via the CAP but the link up at the European level should be done via the Horizon programme. For the European component, relevant ETPs could take the lead. (2015)</i></p>	<p>2.3.6 Bioeconomy socio-economics. New analytical and transectorial models across value chains including tools for spatial disaggregation and consumer values. Barriers to implementation. Opportunities for job creation, SMEs...</p> <p>2.3.7 Benchmarking yield gaps, production and quality losses across Europe in terms of Genotype x Environment x Management interactions and of resource (water, nutrients) efficiencies (address interactions with climate change, cropping systems and socio-economic barriers). This could start with a single crop (e.g. wheat which displays stagnating yields), but could also be address more crops. <u>Priority: Plant ETP</u></p> <p>2.3.8 Breeding for disease resistant crop genotypes adapted to local conditions and deploying resistance genes in landscapes and European regions to maximize their efficiency and their lifespan. Special attention will be paid to emerging plant diseases in the context of climate change. Link with multi-actor project under EIP, e.g. for on-farm-bred varieties <u>Priority: IPWG, Plant ETP</u></p> <p>2.3.9 Developing novel vaccination methods and breeding for robustness (to infectious diseases) in livestock and aquaculture species. See also 2.12. Special attention will be paid to emerging animal diseases in the context of climate change.</p> <p>2.3.10 Developing integrated crop- livestock-renewable energy systems, including aquaculture production as well as the recycling of animal wastes (e.g. through algae), of green wastes and the provision of renewable energy generation (e.g. biogas, heat) and assessing their sustainability and competitiveness. This also includes assessing the (geographical) scale and local systems organisation, and new business models for different regions. (Link with COFASP ERA-Net)</p> <p>2.3.11 Efficiency animal feed chains. Create new opportunities to improve the efficiency of feed chains by optimising the quantity of feed available for the animal, reducing losses, better use of local resources and creating new feed chains of alternative feed resources and by-products of the food chain, thereby reducing waste.</p> <p>2.3.12 Epidemiological monitoring (e.g. early warning systems, on farm detection/diagnostic tools) for early detection, control and eradication of animal and plant diseases/emerging risks. This includes image analysis, and geolocalization technologies (see also 4.1.2 which is more on adaptation)</p> <p>2.3.13 New instruments and new sensors for agricultural productivity and food quality (e.g. agricultural engineering, horticulture, plant and animal phenotyping under climate change, food processing) and for environmental quality (e.g. water, soil and air quality in agricultural landscapes). <u>Priority: IPWG, Plant ETP</u></p> <p>2.3.14 Food safety risks, food traceability and environmental quality in the bioeconomy: integrated studies of emerging risks from biotic and abiotic agents in agricultural/bioeconomy systems especially those recycling organic wastes and waste waters. Reducing potentially harmful molecules in food supply chains, such as microbial pathogens, heavy metals, mycotoxins, biogenic amines, neurotoxins and other organic compounds, as well as the persistent contaminants (dioxins, PCBs, PFOs and PFOA, PBDE, etc). The corresponding risks will be assessed in the context of climate change.</p> <p>2.3.15 Nitrogen and phosphorus losses to the aquatic environment. Development of new approaches (measurements, modeling, data integration) to assess new systems at field, farm, landscape and catchments scales for reducing nutrient loadings to surface waters (streams, lakes, marine environments) that cope with the changes in loss pathways and nutrient transformation processes as affect by climate change and climatic extremes.</p> <p>2.3.16 Agricultural systems for production near metropolises (local food production), in particular horticulture to supply citizens with vegetables.</p>	<p>2.3.1 EXISTING Core-Organic III, Organic Agriculture ERA-NET. Reducing the environmental effects of organic agriculture throughout the value chain and also Functional biodiversity to improve management of pests and diseases and Plant/Soil Interaction. FACCE – JPI and CO will exchange on it might be possible to have a joint call. (Link through to CT4 and CT5)</p> <p>2.3.2 EXISTING Precision agriculture and ICT ERA-NET. Targeted collaboration on crop diversification, crop mixtures, multi-component agriculture, and adaptation of inputs to climatic variability and to GHG mitigation goals.</p> <p>2.3.3 EXISTING IPM, Integrated Pest Management ERA-NET. Targeted collaboration on emerging pests and diseases and on climate change adaptation of IPM strategies. (Link through to CT4)</p> <p>2.3.4 EXISTING ERA-CAPS, Advanced plant sciences. Targeted collaboration on drought, heat and salt tolerance of crop and pasture species, on root symbioses and on primary productivity adaptation to elevated CO₂. (Link through to CT4)</p> <p>2.3.5 NEW ERA-NET: Sustainable bioeconomy supply chains. Integrated approaches to overcome current barriers in bioeconomy supply chains and sustainably produce bioenergy and biomaterials while maintaining food production and increasing soil/biomass carbon stocks through the development of innovative knowledge intensive farming systems and land management at landscape to regional scales. Such systems combine food, feed, bioenergy and biobased products, recycling organic wastes, residues from agricultural production and producing and processing bioresources for industries. Special attention will be paid to GHG mitigation vs. fossil fuel substitution, to indirect land use change impacts and to climate change adaptation.</p> <p>Cat 3. Need common European effort and developing research ⇒ Funding instruments, Infrastructures</p> <p>2.3.17 NEW Infrastructure (I3). Conservation and use of plant genetic resources (including wild plant relatives). Access to genetic resources and (meta)data. Link through to CT4, preserving the genetic potential for adaptation. <u>Priority: Plant ETP</u></p> <p>2.3.18 NEW Infrastructure (I3). Conservation and use of animal genetic resources also to enlarge the basis of adaptation to climate change. Access to genetic resources and to (meta)data. Link through to CT4, preserving the genetic potential for adaptation.</p> <p>2.3.19 NEW Infrastructure. Monitoring water availability and quality for agriculture at river basin level (link through to CT4 adaptation). Such an infrastructure would have a high added value at EU scale to monitor changes in water resources as affected by climate change and by agriculture. Decision support tools for farmers in catchment areas will be developed. <i>See also Water JPI, no overlap with ANAEE</i></p> <p>Cat 2. Emerging subjects ⇒ Scoping instruments (dialog with stakeholders, inputs to Cat 3)</p> <p>2.2.1 Increasing the interactions between environmental sciences, ecology, social sciences and the agricultural science community through joint FACCE JPI sessions/workshops (e.g. of European scientific societies). (2014) <u>Priority: Plant ETP, Important Copa-Cogeca</u></p> <p>2.2.2 How to create synergies and overcome barriers to crop diversification? Markets, breeding, machinery investments, behavioural attitudes of farmers, farm advisors, environmental organisations, researchers, government agencies and industries. (Link to 2.1.2) (2015) <u>Of interest to Plant ETP</u></p>

ANNEX 4. OUTCOMES OF THE MAPPING MEETINGS DISSEMINATION WORKSHOP²²

The Mapping Meetings Dissemination Workshop was the closing act of the mapping activities that FACCE JPI undertook between 2011 and 2014. The objective of this workshop was to gather the specialists involved in mapping and foresight exercises of other JPIs, with the aim to exchange best practices and share FACCE's fruitful experience with the "mapping meetings" approach. Also, an online survey was carried out right after the event.

The main outcomes of the discussions maintained during the event and of the survey done afterwards can be summarized as follows:

- Mapping and foresight activities are a **cornerstone** for the elaboration of SRAs, implementation plans and identification of joint calls. However it must be kept in mind that mapping is not a goal in itself, but an instrument to identify actions to be undertaken.
- Regarding **methodology**, most JPIs have used questionnaires, interviews and desk researches (including bibliometric analysis) in their studies. On the contrary FACCE's Mapping Meetings should be considered as a unique exercise with an innovative approach, which a large majority of the participants (80%) have considered to be a useful or very useful instrument suitable to be applied in other of JPIs. In addition a number of other methodologies, to get some added value by going beyond classical surveys, were mentioned: i) questionnaires, followed by an interview, for precise topics; ii) literature studies commissioned to groups of experts; iii) to combine mapping meetings with quantitative research studies and iv) mappings at national level.
- About the **participants** in a mapping exercise, there is a consensus on the implication of scientific, policy and funding experts. It was also considered advisable the participation of industry/private stakeholders and pre-selected panels of experts.
- Regarding **when to map** the beginning of a JPI procedure seems to be the most suitable moment, to set a rationale for decisions. However since data gets outdated quite fast, mapping should be considered as a continuous process to be renewed frequently or on need basis (to update the SRA and/or implementation).
- **Challenges** for mapping activities developed by JPIs are: to find efficient and effective mechanisms to gather information; to go beyond the European level to a global perspective; to elaborate common, or at least intercomparable, frameworks for mapping at national level; and to improve and reinforce the procedures to go from mapping to new actions in the framework of the Strategic Research Agendas.
- Meetings with a similar approach as developed for mapping can be used in **evaluation and monitoring** of JPIs and their actions, along with other instruments, as it is a complex exercise that requires a new methodology.

In conclusion, this dissemination workshop inspired the JPIs on why and how to do mapping and foresight. The mapping meetings were considered by the other JPIs as a very good practice and approach that may also be suitable in their initiatives.

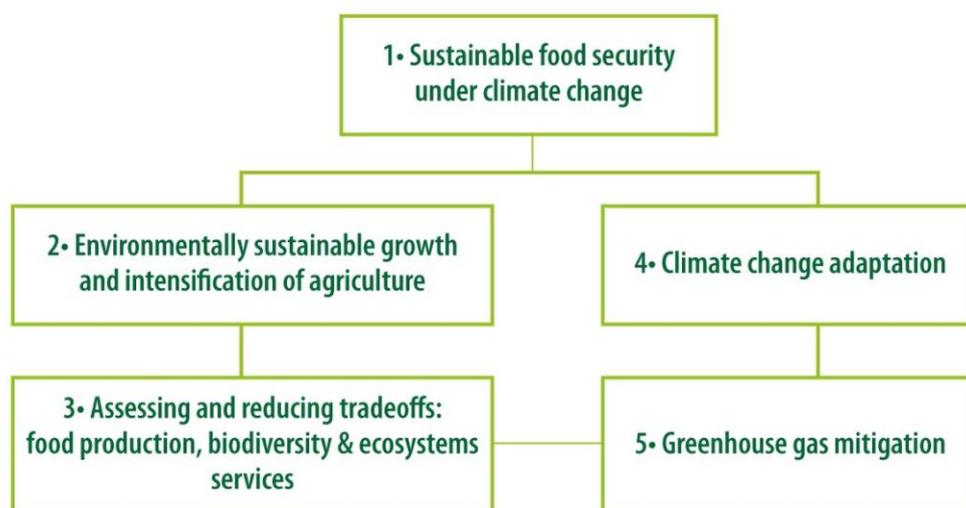
²² Report of FACCE-JPI Mapping and Foresight dissemination activity – Mapping Meetings – Dissemination Workshop (2014)

ANNEX 5. JOINT PROGRAMMING INITIATIVE ON AGRICULTURE, FOOD SECURITY AND CLIMATE CHANGE²³

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 countries 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.*

²³ 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:

