FACCE-MACSUR

MACSUR Phase 1 Final Administrative Report  
(public release)

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Instrument: Joint Programming Initiative  
Topic: Agriculture, Food Security, and Climate Change  
Project: Modelling European Agriculture with Climate Change for Food Security (FACCE-MACSUR)  
Start date of project: 1 June 2012  
Duration: 36 months  
Theme, Work Package: Hub 3  
Deliverable reference num.: D-H3.3  
Deliverable lead partner: Thünen Institute  
Due date of deliverable: M36  
Submission date: 2015-09-01  
Confidential till: –

<table>
<thead>
<tr>
<th>Revision</th>
<th>Changes</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>First Release</td>
<td>2015-09-01</td>
</tr>
<tr>
<td>1.1</td>
<td>Public release (confidential section on funding removed), editorial corrections</td>
<td>2015-09-25</td>
</tr>
</tbody>
</table>
MACSUR - FIRST PHASE REPORT

to be filled in and submitted
by the MACSUR coordinator

to ptj-facciejpi@fz-juelich.de until 01.09.2015

A – General data

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Modelling European Agriculture with Climate Change for Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acronym</td>
<td>FACCE MACSUR</td>
</tr>
<tr>
<td>Official Start (dd/mm/yy)</td>
<td>01/06/2012</td>
</tr>
<tr>
<td>Expected End (dd/mm/yy)</td>
<td>31/05/2015</td>
</tr>
<tr>
<td>Signature date of the Consortium Agreement:</td>
<td>12/06/2013</td>
</tr>
<tr>
<td>Total cost of the project (in k€; this is the sum of the individual project costs for each partner)</td>
<td>8'028 k€</td>
</tr>
<tr>
<td>Total spent funding “in cash” until 31/05/2015 (in k€; this is the sum of the in cash funding spent for each partner)</td>
<td>5'993 k€</td>
</tr>
<tr>
<td>Total “in kind” spent until 31/05/2015 (in k€; this is the difference between the project costs and the spent funding)</td>
<td>2'035 k€</td>
</tr>
<tr>
<td>Total “in kind” contribution (in k€; this is the difference between the project costs and the granted funding)</td>
<td>649 k€</td>
</tr>
<tr>
<td>Total number of Person-Months contributed to MACSUR</td>
<td>1460.26 PM</td>
</tr>
<tr>
<td>Total number of “in kind” Person-Months</td>
<td>657.58 PM</td>
</tr>
</tbody>
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<table>
<thead>
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<tbody>
<tr>
<td><strong>1. Number of articles in peer reviewed international journals and submitted manuscripts</strong></td>
<td>278</td>
</tr>
<tr>
<td>1a. Of which, joint publications</td>
<td>172</td>
</tr>
<tr>
<td><strong>2. Number of contributions in books</strong></td>
<td>22</td>
</tr>
<tr>
<td><strong>3. Number of other publications</strong></td>
<td>21</td>
</tr>
<tr>
<td><strong>4. Number of input to policy makers (estimated)</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>5. Number of oral and poster presentations in scientific congresses</strong></td>
<td>480</td>
</tr>
<tr>
<td><strong>6. Number of organized major international congresses</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>7. Number of press, radio, TV, and internet appearances</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>8. Number of new external grant and total amount of new external grant money, the application resulting from MACSUR activities</strong></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>17'416'972 €</td>
</tr>
<tr>
<td><strong>9. Number of supervised theses</strong></td>
<td>20</td>
</tr>
<tr>
<td><strong>10. Number of joint patents (between partners or resulting from project)</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>11. Number of new collaborations (subset of group or group asking for additional (new) funding)</strong></td>
<td>13</td>
</tr>
<tr>
<td><strong>12. Number of scientific acknowledgements (Prizes, honorary doctorates, memberships in scientific academies, major international duties, etc.)</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>13. Data access: number of new datasets or data/model assets generated in MACSUR (provide in the annex explanations on the storage: is this centralised or in each group? capture data sharing and evidence for this)</strong></td>
<td>&gt;12</td>
</tr>
<tr>
<td><strong>14. Number of other activities (please list them by categories in the annex)</strong></td>
<td>13</td>
</tr>
</tbody>
</table>
### Networking (max. 2 pages)

Please provide relevant lists in Annex

<table>
<thead>
<tr>
<th>1. Number of theme or cross-theme meetings (list in annex)</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Number of consortium meetings (whole MACSUR; list in annex)</td>
<td>8</td>
</tr>
<tr>
<td>3. Number of workshops (list in annex)</td>
<td>7</td>
</tr>
</tbody>
</table>

4. Was the coordination across themes sufficient/satisfactory/adequate? Why? What is the potential for improvement?

<table>
<thead>
<tr>
<th>a) During phase 1, we achieved an in-depth understanding of the requirements for cross-Theme coordination and different approaches applied in the Themes. We satisfactorily managed to streamline coordination towards similar organisational structures, used similar formats for inventories and descriptions of available models, agreed on common core climate and socio-economic scenario assumptions for modelling activities, and jointly set research priorities. This resulted in a wealth of joint scientific publications, training workshops, and new collaborations (funded and unfunded) with scientists and institutions within and outside the knowledge hub.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) We adequately accomplished this through the following:</td>
</tr>
<tr>
<td>• Monthly (on average) meetings (physical or online) among Theme and Hub coordinators</td>
</tr>
<tr>
<td>• Distribution of Theme newsletters (bi-monthly) to all MACSUR members</td>
</tr>
<tr>
<td>• Attendance of Theme representatives at other Theme meetings</td>
</tr>
<tr>
<td>• Close collaboration on joint tasks (e.g. stakeholders, uncertainty, scaling methods, metadata exploration, regional pilot studies) and in specialist meetings</td>
</tr>
<tr>
<td>c) Potential for improvement most likely lies in, and may be realized, for example, through:</td>
</tr>
<tr>
<td>• Introduction of additional cross-cutting tasks that require close interaction among co-leaders from different Themes – specifically, in areas such as developing a position paper for MACSUR; further operationalization and intensification of stakeholder involvement, tackling and further harmonizing the work on uncertainty and risk analysis, scaling methods, scenario development and the development of efficient ways of sharing information across Themes and tasks. This might require strengthening of the organisation structure of the knowledge hub, as by the recently established Project Leadership Team composed of topical and managerial leaders. Moreover, strengthening the network could be facilitated by allocating more responsibilities to task leaders.</td>
</tr>
<tr>
<td>• A considerable period of time is necessary to align interests and approaches for the development and implementation of WPs and tasks in order to create a coherent project structure and facilitate knowledge exchange; all partners ought to be actively involved in this process to ensure they have ownership and understand the overall purpose of activities. The planning period was better for phase 2 than phase 1 but not yet ideal.</td>
</tr>
<tr>
<td>• Stronger interaction between researchers from different Themes at events or cross-thematic publications organized by other Themes with explicit invitations to other Themes to participate.</td>
</tr>
<tr>
<td>• Addressing more prominently and intensively cross-theme topics in the MACSUR Hub Newsletter</td>
</tr>
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</table>

5. Was the integration of work packages sufficient/satisfactory/adequate? Why? What is the potential for improvement?

Overall, engagement varied because, for example, the financial resources of team members were limited in terms of carrying out research and travelling to workshops and conferences. Within all Themes, regular WP leaders meetings (on-line and in person), task and WP level workshops and information sharing with partners through extended minutes and the documentation of meetings facilitated good internal integration of activities. Regular newsletters were produced and shared by CropM, LiveM and TradeM. Across Themes, bilateral visits /exchanges of visiting scientists within WPs and frequent (mutual) invitations of guest speakers from the MACSUR pool to national conferences furthered integration and raised awareness of activities. Within CropM, integration of the six WPs, (C1-C4 on scientific excellence; C5 on capacity building and C6 on case studies impact assessment) was excellent. Integration was achieved by monthly WP leaders meetings; bi-weekly meetings of CropM co-leaders and additional meetings for planning workshops and numerous joint publications, PhD student supervisions and joint interactions (meetings/publications) with other networks such as AgMIP, CCAFS, etc.; WP-specific workshops (with one or more WPs involved; 3-4 per year); exchange through extended minutes/documentation of meetings.
and workshops; PhD courses (two per year) with input from various WPs, and joint organisation and execution of the CropM international symposium and workshop at Oslo, Feb. 2014 (120 participants of which the majority was from CropM – but also other theme-representatives plus AgMIP and CCAFS scientists participating in key roles e.g. session chairs, keynotespeakers); Newsletter to all CropM and hub members (bi-monthly to quarterly) – bilateral visits/exchange of visiting scientists within WPs and frequent (mutual) invitations of guest speakers from CropM to national conferences.

As the research communities involved in LiveM are very disparate (grassland modellers, animal disease modellers, farm-scale modellers etc.) all contacts and exchanges of information through MACSUR represent important strides in understanding. Workshops and task engagement brought WP members together to a greater extent. Integration within LiveM has facilitated the production of joint publications, reports and contributions to international conferences. In Oct. 2014, LiveM organised the Livestock and Grassland Modelling and Research Colloquium (hosted by BC3 in Bilbao, Spain) at which representatives of all three Themes along with invited guests from the Global Research Alliance, EAAP and the Animal Task Force shared their research and were involved in constructive group discussions on the role of the MACSUR knowledge hub and approaches to better integration.

In TradeM a tight integration – linking advancements in science, application in pilot studies, trans-disciplinary approaches including stakeholders, and interaction and capacity building for researchers - is under way. This is convincingly demonstrated in the regional case studies (one of which was featured in *Nature*), which bring together TradeM with CropM and LiveM researchers to investigate region-specific agricultural challenges through an integrated trans-disciplinary approach. While such effort does not comprise all research groups at the same intensity, big strides have been made in achieving amore even involvement. Variable involvement is mainly due to variations in the (limited) financial resources available in different countries. Better integration was achieved by regular personal interaction between researchers who have not been aware of each other previously. TradeM intends to organize at least two workshops per year. The substantial contributions of time and efforts of the partners organizing such workshops creates a network where actually "work" is done. Such workshops have stimulated more consistency in modelling (e.g. shared baseline scenario; model input parameters, etc.) to enhance comparability of integrated regional assessments and other studies in the various partner countries; workshops also helped to initiate enhanced model linkages.

There are several areas in which improvements could be achieved:

- The project structure needs to include more interlinking tasks with specific outcomes requiring collaboration between WPs and avoid creation of artificial structural barriers.
- Some partners had no access to funding even for travel to meetings, which hinders their involvement and reduces their level of ‘buy-in’ to project objectives – this constraint needs to be overcome.
- Meetings across themes outside regular workshops to further build cohesion within the diverse community of agricultural modellers.
- Organisation of events that have reach beyond the MACSUR network and beyond science.
- Regularly updated presentations of findings, suitable and relevant for farmers’ organisations and ministries.
- Allocating/generating more funding resources for exchange of scientists and (PhD) students among partners/WPs

### 6. Equality of engagement of all research teams involved in the theme

<table>
<thead>
<tr>
<th>Engagement varied due to, for example, the huge differences in available financial resources of the teams for carrying out research /participating in workshops and conferences (travelling and fees).</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Number of links to national projects or facilities (list in annex)</td>
</tr>
<tr>
<td>8. Number of links created to other EU or international groups (list in annex)</td>
</tr>
<tr>
<td>9. Number of stakeholder interactions (list in annex)</td>
</tr>
<tr>
<td>10. Did any partner join at a later stage? Who?</td>
</tr>
<tr>
<td>1. Walloon Agricultural Research Centre, Belgium</td>
</tr>
<tr>
<td>2. MTA Centre for Ecological Research, Hungary</td>
</tr>
<tr>
<td>3. International Institute for Applied Systems Analysis, Austria</td>
</tr>
<tr>
<td>4. EURAC Research, Italy</td>
</tr>
<tr>
<td>5. Center for Ecology and Hydrology, United Kingdom</td>
</tr>
</tbody>
</table>
### D - Capacity building (max. 1 page)

*Please provide relevant lists in Annex*

<table>
<thead>
<tr>
<th>1. <strong>Number of trained scientists</strong>&lt;sup&gt;1&lt;/sup&gt;</th>
<th>622</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. In the frame of workshops (multiple participations included)</td>
<td>452</td>
</tr>
<tr>
<td>1b. As PhD students</td>
<td>10</td>
</tr>
<tr>
<td>1c. In the frame of mobility actions (multiple participations included)</td>
<td>150</td>
</tr>
<tr>
<td>2. Number of training workshops (list in annex)</td>
<td>9</td>
</tr>
<tr>
<td>3. Number of specialist workshops (list in annex)</td>
<td>10</td>
</tr>
<tr>
<td>4. Number of established scientific staff (list in annex)</td>
<td>49</td>
</tr>
<tr>
<td>5. Was the collaboration between countries sufficient/satisfactory/adequate?</td>
<td>Yes</td>
</tr>
<tr>
<td>6. Did the project provide opportunities for partners/scientists to become part of the international community of researchers in this field or to further strengthen their own role?</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Number of research communities in the themes (list in annex)</td>
<td>12</td>
</tr>
</tbody>
</table>

<sup>1</sup> Including 2 B.Sc. and 8 M.Sc.
1. Number of deliverables performed (please provide list with due date and delivery date in annex)  
2. Number of milestones achieved (please provide list with due date and achievement date in annex)  

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<tbody>
<tr>
<td>1.</td>
<td>106</td>
</tr>
<tr>
<td>2.</td>
<td>78</td>
</tr>
</tbody>
</table>

3. Definition of, and agreement on, procedures and annually updated plans of work  

Yes.

4. How could the administrative burden of theme-leaders and project coordinators be reduced?  

- Help through qualified coordination support staff (incl. their funding) would be most effective  
- Better quality and easy to use conference organisation software (better than current conventional packages ...)  
- Infrastructure for efficient shared document workflow  
- If we cannot refrain from double reporting (national level and FACCE level, then a common format should be used or be accepted)

5. Was there a written research consortium agreement?  


6. How was the quality of the call procedure? (MACSUR2 preparation)  

6a. Was the submission process appropriate?  

General appropriate; one short-coming was that forms were provided in locked Microsoft-Word format that could not be worked on in track-change mode by several people

6b. Was the call office available for questions?  

Yes

6c. Was the information given clear?  

Yes

7. Which challenges did you face, from an organizational perspective?  

- Tight timelines for composing a large scientific project  
- Very heterogeneous administrative setup of partners groups in the various countries, e.g. funding periods  
- The double function of the knowledge hub as a networking and research instrument provides challenges for the legal arrangements for intellectual property in MACSUR. For example, knowledge created by members within MACSUR with „in-kind“ funding from other projects cannot be shared easily with the whole community; confidential or licensed external data obtained by one MACSUR member (or even the hub) cannot be shared with all MACSUR members without additional negotiations with the data owner because the consortium agreement forbids one member to act on behalf of other members due to concerns of the involved institutes about liability of misappropriated intellectual property.  
- The double nature of the knowledge hub with decentralised funding requires a difficult balance between bottom-up driven decisions by consensus, imposed by the structure, and top-down directions necessary for quick progress and co-ordinated research activities. This could be partially addressed by putting some money into a central funding pool; decision-making on prioritization of hub activities would also be made easier if there were more clearly expressed expectations of knowledge hub output by the GB. Clear focus and adequate funding of hub structures is vital to ensuring and facilitating effective inter-disciplinary collaboration, which often requires neutral brokers to help frame and arbitrate the nature and rules of co-working.  
- Unexpected / unplanned (and therefore non-funded) trips for presentations to GB and SAB and StAB.  
- Existing national funding rules not adapted to novel conditions/requirements of a "knowledge hub"
### 8. Which areas could be improved, from an organizational perspective?

- The structure of MACSUR1 with a Hub and Themes was appropriate in MACSUR1 for establishing stronger ties within the Themes (especially LiveM and TradeM) but made it harder to knot ties across Themes. Therefore, in MACSUR2 more emphasis will be given to cross-Theme links.
- Within the short time available for preparing the proposal of MACSUR1, activities have been planned without knowing the actual funding for partners and their contributions. The reliance on in-kind funds seems to have been over-optimistic in several cases. With the decentralised funding structure of a JPI it would be advisable to revise the planned activities according to the actual funding provided before the implementation of MACSUR2. This would have required earlier national funding decisions (March 2015) – or a revision of workplans at the onset of MACSUR2.
- Funding for some Hub and Theme activities (meeting organisation, internet presence, dissemination activities, stakeholder engagement, travelling scholarship for students) could come from the countries of the coordinators, from a money pool that each country contributes to, or from higher fees per participant of workshops and conferences. The latter option, however, makes the planning of events very difficult because the number of participants is not known in advance.
- Funding level of activities must be commensurate with the Governing Board's, the Scientific Advisory Board's, and the Stakeholder Advisory Board's expectations for research, stakeholder involvement, capacity building and networking. "In-kind funding" is often constrained by purpose, time, space or legal conditions and cannot be allocated or redistributed by the coordinators.

### 9. In which areas and by what means can FACCE JPI assist MACSUR in its progress?

- Establish/maintaining a database of partners during the call process for later use by the hub coordinators
- Provision/administration of central funds for meetings, travelling/stipends
- Requiring a common start date of the project from the funders
- Provisions for partners from non-FACCE members to join (as implemented later)
- Projects involving many members need to invest a proportionally greater share of time and personnel to organisation, project management, and internal communication than smaller projects. Funding agencies must be aware of the need of funding of organisational tasks within a knowledge hub.
- Institutional administrators are still confused about how a knowledge hub is financed. Maybe a flyer targeted at institutional administrators produced by FACCE JPI jointly with the funding organisations might help.
- Evaluation criteria and metrics for future knowledge hubs should be available before or during their planning for guidance when decisions involving trade-offs are necessary.
- The reporting requirements and formats should be co-ordinated among countries and FACCE. MACSUR members must report to national funding agencies, MACSUR/FACCE, and usually to their institution. FACCE should be able to obtain financial reports through the involved funding organisations. A central FACCE database for outputs that can accept the standard bibliographic RIS format (works also for conferences etc.) as interface would reduce tedious manual work (and errors). This database could also be used for the reporting to national agencies. Import and export links to academia.edu, researchgate, orcid.org, researcherid.com would be a plus.
1. To what extent is MACSUR influencing planning and setting priorities for national programmes?

National programmes benefit from contributions of MACSUR in various ways:

- MACSUR results are published in international journals where they are eventually picked up by national administrators.
- MACSUR coordinators are invited by the FACCE GB (with national representatives) to provide overviews of results and identify the contributions of MACSUR to policy support in the participating countries.
- National, FACCE and EU representatives attend scientific meetings (in Europe and elsewhere) where MACSUR results are presented by MACSUR members.
- MACSUR reports are sent to the FACCE Knowledge Hub Evaluation Board for passing on to the GB, SAB, and StAB.
- Meetings, workshops and congresses organized in the context of MACSUR are frequently attended by representatives administering national programmes. The direct dialogues between them and other participants of the scientific events are likely shaping national programmes as well.
- Some partners of MACSUR are part of national boards involved in national programming. Their work therefore contributes directly to setting priorities in national programmes.
- Some partners of MACSUR have met frequently with national representatives on bilateral basis (GB members, etc.) or multi-laterally (national sector level research and ministries) in small groups (national meetings) among others on MACSUR progress – such dialogue directly results in setting priorities in national programmes.

2. To what extent is MACSUR influencing FACCE-JPI and the update of FACCE Strategic Research Agenda (SRA)?

MACSUR has no means or direct channels to influence SRA. But there are many indirect ways of exerting an influence:

- MACSUR results are published in international journals where they are eventually picked up by national administrators.
- MACSUR coordinators are invited by the FACCE GB (with national representatives) to provide overviews of results.
- Through his role a member of the FACCE-JPI scientific advisory board (SAB) a MACSUR steering committee member channels experiences from MACSUR into the SAB and hence the formulation of the SRA
- National, FACCE and EU representatives attend scientific meetings where MACSUR results are presented by MACSUR members.
- MACSUR reports are sent to the FACCE Knowledge Hub Evaluation Board for passing on to the GB, SAB, and StAB.
- Greater engagement by FACCE-JPI through attendance at theme and hub-level conferences could help to cement strong communication, guide effective and timely inputs into the SRA update, and provide the FACCE-JPI governing board with a clearer understanding of the benefits and challenges relating to the knowledge hub and similar networking approaches.

3. Main overlaps and gaps identified between research groups/countries during the MACSUR preparation and implementation/Potential for alignment

**Overlaps:**
- there are many and intended thematic overlaps, e.g. identifications of adaptation strategies in the different regions / countries under consideration;
- there are other intended overlaps, like the work on models, sometimes even the same model
- the spread of best practice and greater engagement between themes in relation to developing community-wide capacity building resources (for example on-line training for modellers and for agricultural professionals) will be an important aspect of MACSUR2, and is required to produce a more joined up and collaborative approach across all three themes in this area.

**Gaps:**
- there is not an equal distribution of scientist of the disciplines involved with access to funds across
countries or regions - in some countries only economists are funded;
• many livestock researchers engaged in MACSUR are located in the UK and receive no additional funding for MACSUR research;
• Further improvements (with funding) are needed to bridge the gap between science and business and policy making - the traditional channels of knowledge transfer are not sufficiently developed yet to make this possible
4. Main achievements, outcomes, outputs, etc… which would not have been possible without MACSUR

Among the main achievements and outcomes which would not have been possible without MACSUR are:

- Awareness of who is active in the area of CC impacts on agriculture.
- Integrated view of CC impacts on agriculture across disciplines and scales.
- Development of a research agenda for improving existing models and working on new models.
- Collaborative papers.
- Exchange of ideas, concepts, and theories between researchers.
- Understanding of data/model demands of other disciplines.
- Communication with stakeholders on models.
- Capacity building among the partners involved.
- Create synergies among research in the participating countries.
- Establishment of a network in Europe that is on par with other international networks.

5. To what extent did MACSUR generate project outcomes contributing to solving problems relevant to tackling the societal challenge of FACCE-JPI?

- Awareness of broader implications of CC and policies in agriculture by including constraints and buffer mechanisms from socio-economy.
- Contributions to external publications (EEA, AgMIP, GB, scientific papers) by MACSUR members.
- Development of recommendations to effectively anticipate projected climate change effects on food security.
- Presents in public media to highlight progress and challenges for addressing societal challenges of FACCE-JPI.
- Interactions with regional, national and international stakeholders on MACSUR results to address challenges of FACCE-JPI.

6. Progress towards alignment of research in the field of MACSUR among the countries involved

A major objective of MACSUR is to promote an alignment of research between partner countries without sacrificing diversity and innovative new ideas and concepts. This is achieved by various means:

- Alignment of research by developing scenarios in international teams and identification of a common focus of research topics.
- Work on joint papers across different nationalities, in particular work on publications with case studies from various countries.
- International comparison of methodologies and performance of models, development of resources (data, presentation).
- Establishing contacts between stakeholders across countries.
- The development of joint research proposals with partners from other countries that would otherwise not be accessible.

7. MACSUR contribution to the FACCE 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”

MACSUR is contributing significantly to major elements of the vision of FACCE, including:

- The establishment of a vibrant community of international researchers committed to improve existing models and to develop new approaches to be able to deliver answers to challenging questions in a quantitative manner.
- MACSUR partners have developed a clear focus on climate change and food security and works actively to improve interaction between researchers and stakeholders of various fields.
- MACSUR partners have further improved models that capture all aspects of a bio-economy under changing climate condition.
### 8. MACSUR contribution to the FACCE SRA Core Theme 1

MACSUR has contributed in various aspects to several elements of Core Theme 1. Among them by

- promoting and facilitating interdisciplinary dialogue that forms the basis of quantitative integrated analyses,
- establishing links between models across disciplines by defining protocols, interfaces and sets of coherent scenario assumptions,
- partners of MACSUR have been involved in international/global efforts to compare model assumptions and results,
- the activities in various networks made available data that were previously not accessible to the international scientific community.

### 9. To what extent is MACSUR leveraging European competitiveness in the field of MACSUR internationally, international relevance and impact of MACSUR?

- European competitiveness and relevance has improved in various ways.
- A major value added is the establishment of a network across national borders in the EU and beyond (Norway, Israel).
- By building a platform for many disciplines across many countries it was possible to reap network effects.
- The international visibility of MACSUR is confirmed by the partnership agreement with AgMIP.
B Output

B1. Articles in peer reviewed international journals and submitted manuscripts


Baker, Alison; Ceasar, S. Antony; Palmer, Antony J; Paterson, Jaimie B.; Qi, Wanjun; Muench, Stephen P.; Baldwin, Stephen A. REPLACE, REUSE, RECYCLE: IMPROVING THE SUSTAINABLE USE OF PHOSPHORUS BY PLANTS. Breeding plants to cope with future climate change., http://dx.doi.org/10.1093/jxb/erv210


Baum Zvi, Ruslana Rachel Palatnik, Iddo Kan and Mickey Rappaport-Rom "Economic Impacts of Water Scarcity under Diverse Water Salinities". Water Economics and Policy (WEP), Special Issue on Economics of Salinity Impacts and Management.


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Boeckx, Tinne; Winters, Ana L.; Webb, K Judith; Kingston-Smith, Alison H. Polyphenol oxidase in leaves; is there any significance to the chloroplastic localisation? Breeding plants to cope with future climate change, http://dx.doi.org/10.1093/jxb/erv141


Bojar W., Knopik L., Żarski J. and Kuśmirek-Tomaszewska R. Integrated assessment of crop productivity based on food supply forecasting. Agricultural Economics (Zemědělská ekonomika)


Bourgeois C., Ben Fradj N., Jayet P.A., Carré F., Bamps C., Zakharo Camacho C. and A. Perez


Caubel Julie, Garcia de Cortazar-Atauri Iñaki, Launay Marie; de Noblet-Ducoudré Nathalie; Huard Frédéric; Bertuzzi Patrick; Graux Anne-Isabelle. Broadening the scope for ecoclimatic indicators to assess crop climate suitability according to ecophysiological, technical or quality criteria., http://dx.doi.org/10.1016/j.agrformet.2015.02.005


Comadira, Gloria; Rasool, Brwa; Karpinska, Barbara; Morris, Jenny; Verrall, Susan R; Hedley, Peter E; Foyer, Christine H; Hancock, Robert D. Nitrogen deficiency in barley (Hordeum vulgare) seedlings induces molecular and metabolic adjustments that trigger aphid resistance. Breeding plants to cope with future climate change, http://dx.doi.org/10.1093/jxb/erv276


Coucheney Elsa; Buis Samuel; Launay Marie; Constantin Julie; Mary Bruno; Ripoche Dominique; Beaudoin Nicolas; Ruget Françoise; Garcia de Cortazar-Atauri Iñaki; Andrianarisoa Sitraka; Justes Eric; Léonard Joël. Accuracy, robustness and behavior of the STICS v-8 soil-crop model for plant, water and nitrogen outputs: evaluation over a wide range of agro-environmental conditions. Submitted manuscript., http://dx.doi.org/10.1016/j.envsoft.2014.11.024


Leclère D, Jayet P.A., De Noblet Ducoudré N., (2013), Fa...
Temperature and precipitation effects on wheat yield across a European transect: a crop model ensemble analysis using impact response surfaces, Climate Research, in press


Ponti, Luigi; Gutierrez, Andrew Paul; Ruti, Paolo Michele; Dell’Aqua, Alessandro (in press). Fine-scale ecological and economic assessment of climate change on olive in the Mediterranean Basin reveals winners and losers. Proceedings of the National Academy of Sciences of the U.S.A.,

http://www.pnas.org/cgi/doi/10.1073/pnas.1314437111


Ramirez-Villegas, Julian; Watson, James; Challinor, Andrew J. Identifying traits for genotypic adaptation using crop models. (2015)Breeding Plants to cope with Future Climate Change, http://dx.doi.org/10.1093/jxb/erv014


Rötter, Reimund P; Tao, Fulu; Höhn, Jukka G; Palosuo, Taru. Use of crop simulation modelling to aid ideotype design of future cereal cultivars. Breeding plants to cope with future climate change, http://dx.doi.org/10.1093/jxb/erv098


Sanna M., Bellocci G., Fumagalli M., Acutis M. Interrelationship and optimal choice of indicators to evaluate performance of agrometeorological models


Sanz-Cobena A, Sánchez-Martín L, García-Torres L, Vallejo A., 2012. Gaseous emissions of N2O and NO and NO3 − leaching from urea applied with urease and nitrification inhibitors to a maize (Zea mays) crop. Agriculture, Ecosystems and Environment 149: 64–73


Schönhart, M., I. Nadeem, 2015, Direct climate change impacts on cattle indicated by THI models. Advances in Animal Biosciences, 6:17-20


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Shrestha S, M Abdalla, T Hennessy, D Forristal and M Jones, 2014. Irish farms under climate change – is there a regional variation on farm responses? Journal of Agricultural Science (in press), http://dx.doi.org/10.1017/S0021859614000331

Siczek, A, Horn, R., Stratonovich, Pierre; Semenov, Mikhail. Heat tolerance around flowering in wheat identified as a key factor for increased yield potential in Europe under climate change. Breedig plants to cope with future climate change, http://dx.doi.org/10.1093/jxb/erv070


Van Bussel, Ewert, F. et al. Spatial sampling of weather data for regional crop yield simulations. Submitted manuscript


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Waterworth, Wanda M; Bray, Clifford Melville; West, Christopher E. The importance of safeguarding genome integrity in germination and seed longevity. Breeding plants to cope with future climate change, http://dx.doi.org/10.1093/jxb/erv080


B2. Contributions in books


B4. Input to policy makers

Austrian MACSUR Stakeholder Workshop. Vienna, Austria. From 24.05.2013 to 24.05.2013 (TradeM). Goal: stakeholder participation. Attendance: 15. Organised by WIFO, Austrian Institute of Economic Research. distributed among participants, available upon request

Climate-change impacts on farming systems in the next decades:— why worry when you have CAP? A FACCE MACSUR workshop for policymakers. Brussels, Belgium. From 06.05.2015 to 06.05.2015 (Hub). Goal: Stakeholder interaction and learning. Attendance: 40. Organised by Thünen Institute.
http://ojs.macsur.eu/index.php/Reports/issue/view/7


Köchy, M.: MACSUR. Poster presentation at »GAP nach 2013 und weitere Analysen der agrarökonomischen Institute des Thünen-Instituts«. 09.06.2013 (Hub)

MACSUR (Banse, Ewert, Brouwer, van Middelkopp, Roggero, Lotze-Campen, Köchy): Climate-change impacts on farming systems in the next decades:— why worry when you have CAP? MACSUR workshop for policymakers, Brussels, Attendance: 45. 06.05.2015 (Hub/LiveM/CropM/TradeM)

Palatnik, R.R.: Meeting with chief economist of the Israeli Ministry of Agriculture Dr. Yael Kahal to define policy scenarios for the project analysis. 09.04.2014 (TradeM)


Wilson, A.: ANIHWA Foresight Workshop on Disease Driver Prioritisation. 2014-04-02 to 2014-04-03 (LiveM)


Workshop "Adaptation strategies of Italian agricultural systems to climate change", Cagliari, Italy. From 19.06.2013 to 19.06.2013 (CropM/LiveM/TradeM). Goal: Meeting with Stakeholders including regional and national policy makers. Attendance: 150. Organised by University of Sassari.

B5. Oral and poster presentations in scientific congresses

Acutis M., Bellocci G. – Briefing on CropM-LiveM model intercomparision protocol – JPI FACCE MACSUR CropM and LiveM cross-cutting activity Helsinki, Finland – From 06.06.2013 till 07.06.2013 – (CropM)


Ayalon, O. – Welcome Address of the Director Natural Resource and Environmental Research Center – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Banse M. – FACCE-JPI Achievements to date: MACSUR – FACCE-JPI 3-year Anniversary Date – From 22.10.2013 till 22.10.2013 – (Hub)


Banse, M. – MACSUR (Modelling European Agriculture with Climate Change for Food Security) – LIAISE Annual Meeting, Tallinn, Estonia – From 25.03.2013 till 28.03.2013 – (Hub)

Banse, M. – MACSUR European experience in addressing the complexity of climate impact research in agriculture: Lessons for replication elsewhere – Global Forum on Climate Change, Food Security and Trade, FAO, Rome – From 03.06.2014 till 04.06.2014 – (Hub)


Baum, Z., R. R. Palatnik – Assessing the Impact of Climate Change on the Israeli Water Economy via a Linked CGE and Farm-Level Model – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


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Ben touhami, H., Bellocci, G. – Bayesian calibration of the Pasture Simulation model (PaSim) to simulate emissions from long-term grassland sites: a European perspective – Livestock, Climate Change and Food Security, Madrid, Spain – From 19.05.2014 till 20.05.2014 – (LiveM)


Cezary Ślawiński, Jaromir Krzyzczak – Institute of Agrophysics PAS and MACSUR presentation – “Rola lasu w pochłanianiu dwutlenku węgla z atmosfery”, Tlen, Poland – From 22.10.2014 till 24.10.2014 – (CropM)


Cohen, S. – Climate change and Israeli Agriculture – resilience, adaptation, land use and production – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)

Conradt, T. – Introduction to the eco-hydrological model SWIM, recent applications and new developments – Solicited lecture at the Faculty of Agricultural Sciences of Baoding Normal University, Baoding, Hebei, P. R. China – From 20.10.2013 till 27.10.2013 –


Dalggaard T. – LiveM WP4: Methods for regional scale farming systems modelling and uncertainty assessment – sustainability assessment case studies of production, nutrient losses and greenhouse gas emissions from


Doltra, J., Olesen, J.E., Báez, D., Chirinda, N. – Simulating seasonal nitrous oxide emissions from maize and wheat crops grown in two different cropping systems in Atlantic Europe. – MACSUR CropM International Symposium and Workshop: Modelling climate change impacts on crop production for food security, Oslo, Norway – From 10.02.2014 till 12.02.2014. – (CropM)


Dono Gabriele, Raffaele Cortignani, Paola Deligios, Luca Doro, Luca Giraldo, Luigi Ledda, Graziano Mazzapicchio, Massimiliano Pasqui, Pier Paolo Roggero – Economic assessment of the impact of uncertainty associated with short-run change in climate variability in Mediterranean farming systems. – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 –


ICT Innovation, Torino, Italy – From 23.06.2013 till 26.06.2013 – http://orbi.ulg.ac.be/handle/2268/150070 (CropM)


Fereres A, Dáder B, Moreno A, Gwynn-Jones D, Winters A. – Aphid and whitefly performance is directly affected by UV radiation on horticultural crops. – Final Network Meeting ofCOST Action FA0906 UV4Growth. Bled, Slovenia. – From 30.03.2014 till 02.04.2014 – (CropM)


Fereres, A. – Photoselective barriers for managing insect vectors of virus diseases in protected environments – Agricultural Film International Conference (MAdrid) – From 06.11.2012 till 08.11.2012 – (CropM)

Fereres, A. – Virus-vector-host plant interactions: Factors that influence the spread of hemipteran-borne plant viruses. – American Phytopathological Society Conference Austin,Texas – From 10.08.2013 till 14.08.2013 – (CropM)


Floor Brouwer, Franz Sinabell, Waldemar Bojar, Oyvind Hoveid, Gabriele Dono, Katharina Helming – The main findings of TradeM, achieved during the first year – Workshop on Regional Pilot Studies Braunschweig, Germany – From 05.06.2013 till 07.06.2013 – (TradeM)
Fox, Naomi – Climate, soil-transmitted helminths and livestock production – Workshop: Modelling interactions between climate and livestock pathogen transmission – From 22.01.2014 till 22.01.2014 – http://www.research.pirbright.ac.uk/intent/macsur/workshop/ (LiveM)


Frank, S., Witzke, F., Zimmermann, A., Havlík, P., Ciaian, P. – Climate Change Impacts on European Agriculture: A Multi Model Perspective – 14th EAAE Congress, Ljubljiana (Slovenia) – From 26.08.2014 till 29.08.2014 – (TradeM)


Fung, Fai – Modelling livestock and grassland systems under climate change – Workshop: Modelling interactions between climate and livestock pathogen transmission – From 22.01.2014 till 22.01.2014 – http://www.research.pirbright.ac.uk/intent/macsur/workshop/ (LiveM)


Gutiérrez, L. F, Piras, P. Roggero – Short and long-run impact of climate changes on worldwide grain prices – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Harstad, Odd Magne; Bonesmo, Helge Sverre; Özkan, Şeyda – MACSUR – utfordringer for husdyrproduksjon i et framtidig klima (MACSUR- Challenges for livestock production in a future climate) – Bioforsk-
Holman I, Audsley E, Sandars D, Janes V, Trnka M, Sabate S
Höglind M.
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Hoffmann H., Zhao G., V
Hoffmann H.
Alud, Z., Trnka, M., Pohanková, E., Balek, J., Hlavinka, P., Kersebaum, Dubrovský, D., Ba
on Environmental Modelling and Software, San Diego, California, USA – From 15.06.2014 till 19.06.2014 – N (LiveM)


Hoveid, Ø. 2014 – Linking models of climate, weather, crops and economic behavior by Bayesian calibration. – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – (TradeM)


Iglesias, A. – Impacts of CAP relative to climate with respect to adaptation – "Climate-change impacts on farming systems in the next decades — why worry when you have CAP?" A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 06.05.2015 – http://macsur.eu/index.php/events/macsrc-workshop-for-policymakers (TradeM)

J. Krzyższczak – Modelling of CO2 exchange in cultivated field – Summer school: Flux measurement techniques for non CO2 GHGs: methods, sensors, databases and modelling – From 04.05.2013 till 12.05.2013 – (CropM)


Jorgenson, J. S. – Options for Cloud computing – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM, Hub)

Kahn, I., M. Raport-Rom – Assessing the Impact of Climate Change on Vegetative Agriculture in Israel – The VALUE Model – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and
Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)

Kan I. – Assessing the Impact of Climate Change on Vegetative Agriculture in Israel – The VALUE Model – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Kersebaum, K.C., Bindi, M. – Progress report WP1 Model inter-comparison and improvement – JPI FACCE MACSUR CropM and LiveM cross-cutting activity Helsinki, Finland – From 06.05.2013 till 06.05.2013 – (CropM)

Kersebaum, K.C., Bindi, M., Olesen, J.E. and Trnka, M. – WP 1/WP2 Data sharing and handling policy – JPI FACCE MACSUR CropM and LiveM cross-cutting activity Helsinki, Finland – From 06.05.2013 till 06.05.2013 – (CropM)


Kersebaum, K.C., Kollas, C., Palosuo, T., Bindi, M., Nendel, C. – WP1 - Protocols, data formats and data classification scheme– JPI FACCE MACSUR CropM and LiveM cross-cutting activity Helsinki, Finland – From 06.05.2013 till 06.05.2013 – (CropM)


Kirchner, M., Mitter, H., Schönhart, M., Schmid, E., Kindermann, G. – A spatially explicit integrated assessment of agricultural policy and climate change impacts on Austrian land use and environment. – 133rd EAAE seminar "Developing Integrated and Reliable Modeling Tools for Agricultural and Environmental Policy Analysis", Crete, Greece – From 15.06.2013 till 16.05.2013 – (TradeM)


Lamorski K., Pastuszka T., Krzyszczak J., Slawinski C., Witkowska-Walczak B. – Modelling soil water Dynamics Using the physical and soft-computing methods. – 10th International Conference on Agrophysics – From 05.06.2013 till 07.06.2013 – (CropM)

Lamorski, K. – Application of X-ray computational microtomography and modeling for estimation of the saturated water conductivity of the porous media. – 12th International Workshop for Young Scientists “BioPhys Spring 2013”. Lublin, Poland. – From 21.05.2013 till 23.05.2013 – (CropM)


Lazar, C. – Modelling of crop growth and development as an instrument for analysis of orientations in agricultural research in the context of climate changes (context and opinions) (In Romanian: Modelarea crestării şi dezvoltării plantelor de cultură ca instrument de analiză a direcţiilor de cercetare agricolă în contextul schimbărilor climatice) – Workshop on climate change organized by Romanian Academy of Sciences (Bucharest, Romania) – From 23.11.2012 till 23.11.2012 – (CropM)


Lehtonen, H., R. Rötter, T. Paluso – Farm level analysis as a key to integrated regional case studies in Finland – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Lotze-Campen, H. – EU-level assessments and scenarios – "Climate-change impacts on farming systems in the next decades — why worry when you have CAP?" A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 06.05.2015 – http://macsur.eu/index.php/events/macsur-workshop-for-policymakers (TradeM)

Lotze-Campen, H. – Panel Discussion: "A Place at the Table" – 2013 Borlaug Dialogue: Biotechnology, Sustainability and Climate Volatility, Des Moines, Iowa /USA – From 15.10.2013 till 2013-1018 –

Lotze-Campen, H. – Sustainable land use and climate change: Monitoring, modelling, managing – Vortrag im Rahmen des Berufungsverfahrens zur Besetzung der W3-S-Professur "Nachhaltige Landnutzung und Klimawandel", Humboldt-Universität Berlin, Landw.-Gärtn. Fakultät – From 08.01.2013 till 08.01.2013 –


Mansouri, M., Dumont, B., & Destain, M.-F. (2014). – Predicting Grain Protein Content of Winter Wheat – 22nd European Symposium on Artificial Networks, Computational Intelligence and Machine Learning


McIntyre, Marie – Predicting the effects of climate change on pathogens – Workshop: Modelling interactions between climate and livestock pathogen transmission – From 22.01.2014 till 22.01.2014 – http://www.research.pirbright.ac.uk/intent/macsur/workshop/ (LiveM)


Milford A.B. – Achieving Emission Reduction Targets by Changing Eating Habits in Norway – Forskermøtet 2015, The 37th Annual Meeting of the Norwegian Association of Economists – From 05.01.2015 till 06.01.2015 – (TradeM)


Minet, Julien; Tychon, Bernard; Jacquemin, Ingrid; François, Louis – Can a global dynamic vegetation model be used for both grassland and crop modeling at the local scale? – MACSUR CropM International Symposium and Workshop: Modelling climate change impacts on crop production for food security, Oslo, Norway – From 10.02.2014 till 12.02.2014. – (CropM, LiveM)

Mingelgrin, Uri – Alternative Water Sources to Compensate for Loss of Water Availability to Agriculture due to Climate Change – TradeM International Workshop, Securing Food Using Non-Convention Water Sources – From 24.02.2015 till 24.02.2015 – https://drive.google.com/folderview?id=0B4oPwB7wQMT9flVTQndXY3piekVzcU9Oa1ppOV9kbUFV3JuV mi02ExPWIzWFIJMGFPT2s&usp=sharing (TradeM)


climate change impacts on crop production for food security, Oslo, Norway – From 10.02.2014 till 2014-0212 – (TradeM)


Modelling European Agriculture with Climate Change for Food Security – From 15.10.2012 till 16.10.2012 – (TradeM)


Müller C – Climate change impacts, uncertainties and implications – First Workshop Expert Network "Management of Climate change induced Risks", Hamburg, Germany – From 20.03.2013 till 21.03.2013 – (CropM)

Müller C – Impacts of Climate Change and Agricultural Modeling – Capacity Building Workshop for Regional Scientists Turn Down the Heat III: Regional Analysis (MNA/LAC/ECA), The Case for Resilience, Potsdam, Germany – From 11.03.2014 till 13.03.2014 – (CropM)

Müller C – Multi-sector interaction in climate change impact analysis – Impacts World 2013, International Conference on Climate Change Effects, Potsdam, Germany – From 27.05.2013 till 30.05.2013 – (CropM)


Müller C, Elliott J – The Global Gridded Crop Model Intercomparison - Approaches, insights and caveats of modeling climate change impacts on agriculture at the global scale – FAO expert consultation on climate change and trade, Rome, Italy – From 05.11.2013 till 06.11.2013 – (CropM)


Øygarden, L – MACSUR- a knowledge Hub – National Conference- Research Council Norway- about JPI-FACCE.Oslo, Norway, – From 29.05.2014 till 29.05.2014 – (Hub)


Özkan Ş., Østergaard S., Strand T. – Modelling The Impact Of Diseases On Greenhouse Gas Emissions In Dairy Cows. – Animal Health & Greenhouse Gas Emissions Intensity Network 2nd meeting, Montpellier, France – From 15.03.2015 till 15.03.2015 – (LiveM)


Özkan, Şeyda; Ahmadi, Bouda Vosough; Bonesho, Helge Sverre; Österås, Olav; Stott, Alistair; Harstad, Odd Magne – Environmental impacts and economics of high somatic cell count in Norwegian dairy herds – NJF seminar 476: Economics of Animal Health and Welfare – From 02.10.2014 till 03.10.2014 – (LiveM)


Palatnik R. R. – Assessing The Impact Of Climate Change On Agriculture And A Water Economy With A Diverse Mix Of Water Types - The Israeli Case Study – Western Economic Association International 89th Annual Conference, Denver, USA – From June 27, 2014 till July 1, 2014 – (TradeM)

Palatnik R. R. – Assessing the Impact of Climate Change on the Israeli Water Economy via a Linked CGE and Farm-Level Model – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Pirttioja N. – Economic Impacts Of Water Scarcity Under Diverse Water Salinities – TradeM International Workshop, Securing Food Using Non-Conventional Water Sources – From 24.06.2015 till 24.06.2015 – https://drive.google.com/folderview?id=0B4oPw87wQMT9fIVTQndXY3piekVzczU9Oa1ppOV9kbUFV3JuVe/mi02EzWUzWjJmGFPT2s&usp=sharing (TradeM)


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Roggero, PP. – Oristano, Sardinia, Italy – “Climate change impacts on farming systems in the next decades — why worry when you have CAP?” A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 06.05.2015 – http://macsur.eu/index.php/events/macsur-workshop-for-policymakers (CropM)

Rolinski S., Weindl I., Heinke J., Bodirsky B.L., Biewald A., Lotze-Campen H. – Environmental impacts of grassland management and livestock production – FACCE MACSUR Mid-Term Scientific Conference

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Rötter RP et al. – Uncertainties in modelling impacts of climate change and variability on crop production – focus on Europea-led efforts in FACCE MACSUR. – FAO expert consultation on climate change and trade, Rome, Italy – From 05.11.2013 till 06.11.2013 – (CropM)


Schaap, B. P. Reidsma, J. Verhagen – Agro Climate Calendar, a simple methodology to identify local adaptation for farm objectives – Climate-smart agriculture 2015. Global Science Conference. Montpellier, France – From 15.03.2015 till 18.03.2015 – http://csa2015.cirad.fr/program (CropM)

Schechter, M. – Welcome Address of the Founder and Distinguished Chair of Natural Resource and Environmental Research Center – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Schmitz, A. Biewald, H. Lotze-Campen – Interactions between agricultural trade liberalisation and the environment - An analysis with a global land use model – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Schönhart, M., Koland, O., Schmid, E. – Linking bio-physical, bottom-up and top-down economic models to analyze climate change impacts and adaptation on Austrian agriculture. – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Schönhart, M., Schauppenlehner, T., Kuttner, M., Kirchner, M., Schmid, E. – Integrated Assessment of Climate Change Mitigation and Adaptation Impacts at Field and Farm level in the Austrian Mostviertel Region. – TradeM International Workshop 2014 »Economics of integrated assessment approaches for agriculture and the food sector«, Hurdalsjøen, Norway – From 25.11.2014 till 27.11.2014 – (TradeM)

Schönhart, M., Schauppenlehner, T., Kuttner, M., Kirchner, M., Schmid, E. – Integrated Assessment of Climate Change Mitigation and Adaptation Impacts at Landscape level in the Austrian Mostviertel Region– MACSUR Conference 2015 "Integrated Climate Risk Assessment in Agriculture & Food", Reading – From 08.04.2015 till 08.04.2015 – (TradeM)

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Schönhart, M., Schaeppelechner, T., Kuttner, M., Kirchner, M., Schmid, E. – Integrated Assessment of Climate Change Mitigation and Adaptation Impacts at Landscape level: Mostviertel, Austria – "Climate-change impacts on farming systems in the next decades — why worry when you have CAP?" A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 08.05.2015 – (TradeM)


Semenov MA (2013) – Modelling predicts that heat stress, not drought, will increase vulnerability of wheat in Europe. – InterDrought IV, Perth, Western Australia – From 02.09.2013 till 06.09.2013 – (CropM)


Sieber, St. – Trans-SEC and the Tanzanian Case Studies Morogoro and Dodoma – MACSUR TradeM Workshop on Global Food Security Challenges – European Research approaches. Leibniz Centre for
Agricultural Landscape Research (ZALF), Müncheberg, Germany – From 18.11.2013 till 20.11.2013 – http://www.macsur.eu/ (TradeM)


Stefanczyk E., Sobkowiak S., Śliwa J. – Polish population of fungi belonging to Fusarium genus and associated with potato dry rot – Summer School of Bioinformatics, Poznań, Poland – From 19.08.2013 till 23.08.2013 – (CropM)


Te Roller, J. – Agricultural model for the Nile Basin Decision Support System – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Van Middelkoop, J. – Livestock and feed production, especially dairy and beef – “Climate-change impacts on farming systems in the next decades – why worry when you have CAP?” A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 06.05.2015 – http://macsur.eu/index.php/events/macsur-workshop-for-policymakers (LiveM)

Van Middelkoop, Jantine – Promoting climate mitigation on agricultural and forest land through the CAP – Workshop European Commission Brussels – From 06.03.2015 till 06.03.2015 – http://capnetworkworkshop.aeasolutions.co.uk/ (LiveM)


Ventrella D., Giglio L., Charfeddine M. – Climate and nitrogen fertilization for winter durum wheat and tomato cultivated in Southern Italy – 18th Nitrogen Workshop. The nitrogen challenge: building a blueprint for nitrogen use efficiency and food security – From 30.06.2014 till 03.07.2014 – http://www.initrogen.org/node/199 (CropM)

Ventrella D., Giglio L., Charfeddine M. 2014. – Climate change and nitrogen fertilization for winter durum wheat and tomato cultivated in Southern Italy. – Lavoro accettato per gli Atti del “18th Nitrogen Workshop”, Lisbona. – From 30.06.2014 till 03.07.2014


Virkajärvi, P. – Northern Savo, Finland – “Climate-change impacts on farming systems in the next decades – why worry when you have CAP?” A FACCE MACSUR workshop for policymakers, Brussels – From 06.05.2015 till 06.05.2015 – http://macsur.eu/index.php/events/macsur-workshop-for-policymakers (LiveM)


Wu, L., A. P. Whitmore – Using SPACSYS to analyse the interaction between plant and environment in a systems approach – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


Zander, P. – Modelling regional land use and climate change adaptation strategies in Northern Germany – MACSUR TradeM workshop: "Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security", The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)


change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 –
Zimmermann, A., Britz, W., Adenäuer, M., Heckelei, T. – Food Security Assessment with CAPRI – MACSUR TradeM workshop: “Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security”, The Natural Resource and Environmental Research Center (NRERC), University of Haifa, Israel – From 03.03.2013 till 05.03.2013 – http://www.macsur.eu/ (TradeM)
http://www.macsur.eu/ (TradeM)
http://www.macsur.eu/images/eventlist/meeting_docs/CropM_Oslo_Symposium_Abstract_Book.pdf (CropM)

B6. Organized major international congresses


http://macsur.eu/index.php/international-symposium-and-workshop
http://macsur.eu/index.php/tradem/2015-03-09-10-38-26

Annexes, p. 44
B7. Press, radio, TV, and internet appearances

Agra-Europe: vTI koordiniert neues Forschungsprojekt 'Macsur' in Agra-Europe 35/12, p. 26. 27.08.2012 (Hub)

BBC World Service: Radio interview with A. Wilson on bluetongue control for Science in Action. 24.10.2014 (LiveM)

BBC Radio 4: Costing the Earth: Outbreak, Radio interview with A. Wilson. 21.03.2012 (LiveM)

Bojar, Waldemar: Website of the UTP Description of the project MACSUR goals and progress in the tasks realization. 01.12.2013 (TradeM)


Department of Environmental and Primary Industries. 16.10.2014 (CropM)

HR3: Interview with M. Köchy on 'Alle Wetter' HR3 German public TV. 03.09.2012 (Hub)

Julien Minet: Publication of a website about FACCE and MACSUR activities in Belgium, with a blog about conferences and events related to topics of MACSUR. (CropM, LiveM)

KlimAktiv: Forscher ergründen Zusammenhänge zwischen Klimawandel und Ernährung’ by KlimAktiv gGmbH. 27.08.2012 (Hub)


NDR Info: Wie wirkt sich der Klimawandel auf die Landwirtschaft aus? Radio interview with Dr. Martin Banse on NDR Info show "logol". 05.10.2012 (Hub)

Palatnik, R.: Call for TradeM workshop in Haifa, Israel on the website of EAERE-European Association of Environmental and Resource Economists. 01.02.2013 (TradeM)

Regio: Klimafolgen für Lebensmittel. Regjo. Das Regional-Journal für Südostniedersachsen. 05.2012, p. 52. 01.10.2012 (Hub)

Rolinski, S., Biewald, A.: Studio Campus of the regional radio station (science meets journalism). 18.02.2014 (TradeM)

Kronenzeitung: Expertenforum: Nachhaltige Landwirtschaft - Erfolge sind da, der Weg ist aber noch lang (sustainable agriculture - success is there but there is still a long way to go). Contribution of F. Sinabell. 2014-03-22 (TradeM)


Śliwka, J.: W Europie szerzają się nowe genotypy Phytophthora infestans, organizmu powodującego zarazę ziemniaka - a popular science article in Ziemniak Polski, in Polish. 01.06.2013 (CropM)

Sobkowiak, S., Śliwka, J.: Grzyby z rodzaju Fusarium powodują zgniliznę bulw ziemniaka - a popular science article in Ziemniak Polski, in Polish. 01.12.2013 (CropM)

MACSUR Homepage: http://macsur.eu

MACSUR on Facebook: https://www.facebook.com/pages/FACCE-MACSUR

MACSUR on Twitter: https://twitter.com/faccemacsur

B8. New external grant and total amount of new external grant money, the application resulting from MACSUR activities

Adaptation in Austrian cattle and milk production (ADAPT-CATMILK). Austrian Climate Research Programme research grant. Partners: WIFO, BOKU, University Cranfield, Thünen Institute (TradeM, reported by Martin Schönthart, 20.05.2014, 247’113 €)

AGROSCENARI – Scenari di adattamento dell’agricoltura italiana ai cambiamenti climatici (CropM, reported by M. Köchy, 18.12.2013, 8’143’268.70 €)

IC-FAR — Linking Long Term Observatories with Crop Systems Modeling For a better understanding of Climate Change Impact, and Adaptation STRategies for Italian Cropping Systems. National Project funded by the Ministry of Education, University and Research, linked with MACSUR (CropM, reported by M. Köchy, 09.07.2013, 868’000 €)

Integrated modelling of Nordic farming systems for sustainable intensification under climate change (CropM, reported by M. Köchy, 10.07.2013, 661’912 €)

New research project "Metrics, Models and Foresight for European Sustainable Food and Nutrition Security (SUSFANS)" funded by the European Commission, 2015-2019 (TradeM, reported by Andrea Zimmermann, 02.07.2015, 5’299’993.64 €)

New research project "Pathways linking uncertainties in model projections of climate and its effects (PLUMES)" funded by the Academy of Finland, 2014-2018 (CropM, reported by Stefan Fronzek, 02.07.2015, 989’707 €)

Research project with some partners involved in MACSUR funded by the Belgian Federal Science Policy (BELSPO): Modelling and Assessing Surface Change impacts on Belgian and Western European climate (MASC) (CropM, reported by Julien Minet, 20.05.2014, 1’196’978 €)

Transferencia científico-tecnológica para evaluación del impacto del cambio climático en los sistemas agrarios de Ecuador y los recursos hídricos (CropM, reported by M. Ruiz-Ramos, 21.05.2015, 10’000 €)
B9. Supervised theses
Seifried, A. A. Soy bean production in Austria - actual situation and production potential in a climate change scenario. Started January 2014. Institut für nachhaltige Wirtschaftsentwicklung, BOKU Vienna. M.Sc. thesis. (TradeM)
Świerk, W (2012) Changes in the quality of surface water bodies against the background of the implementation of the sustainable development program of rural areas in the catchment. Institute of Technology and Life Science at Falenty. PhD thesis. (CropM)

B10. Joint patents (between partners or resulting from project)

B11. New collaborations (subset of group or group asking for additional (new) funding)
Coordination of a joint proposal in the Joint Programming Initiative "Agriculture, Food Security and Climate Change (FACCE-JPI)”. Phase II http://www.chil.org/profile/spanish.macsur/main (Partners participating: MTT Agrifood Finland, University of Bonn, INRA France, Polytechnical University of Madrid) (TradeM, reported by Anne Biewald, 15.05.2014)

FACCE-ERA-NET+ on Climate Smart Agriculture: Joint application, Project Acronym: NEMANICHE - Predicting and testing climate change-induced range shifts in phytopathogenic nematodes in the European agricultural biosphere; date to be decided, September 2014. (TradeM, reported by C.Hoffmann, 20.05.2014)

H2020 SFS18-2015. FairFarm. Stage-2-proposal submitted June 2015. MACSUR partners EURAC, Thünen Institute, James Hutton Institute and non-MACSUR members. (Hub, reported by M. Köchy, 08.07.2015)

JPI- FACCE- SURPLUS. Coordination of a joint application "Towards sustainably intensified and resilient production systems in European Agriculture. Prospects for integrating dairy and bioenergy production systems (DAIRYENERGY)", submitted 04.03.2015. MACSUR partners from Norway, Belgium, Italy. (CropM, reported by Lillian Øygarden, 28.06.2015)

Norwegian partners participating in 3 submissions with partners in MACSUR to the call FACCE/ERANET+ Climate Smart Agriculture (CropM, TradeM, reported by Lillian Øygarden, 26.05.2014)

Setting-up of a regional network related to FACCE and MACSUR in Wallonia, Belgium (see www.facce.be) (CropM, LiveM, reported by Julien Minet, 09.07.2013)

Soy Bean Production in the River Danube Basin. Research proposal submitted to the Austrian Climate Change Research Program ACRP. (TradeM, reported by Franz Sinabell, 10.09.2013)

Submission of a research project within the Belgian partners involved in MACSUR to a Belgian national funding scheme. Unfortunately rejected. (CropM, LiveM, reported by Julien Minet, 09.07.2013)

Submission of two research projects with partners involved in MACSUR and private partners to the call FACCE/ERANET+ Climate Smart Agriculture (LiveM, reported by Julien Minet, 20.05.2014)

Submission to Norwegian Research council (April 2014) application involving MACSUR partners Norway, MTT Finland, Potsdam (CropM, TradeM, reported by Lillian Øygarden, 26.05.2014)

B12. Scientific acknowledgements (Prizes, honorary doctorates, memberships in scientific academies, major international duties, etc.)

Porter, John (2014) Lead author of IPCC AR5-WG2 Chapter on food security (CropM)

Sinabell, Franz (2012) nominated by AUSTRIA to the Steering Committee of the High Level Panel of Experts on food security and nutrition (HLPE), which will provide regular inclusion of structured expertise as an important input to the reformed Committee on World Food Security (CFS). (TradeM)

Kersebaum, Kurt Christian (Leibniz Centre ZALF (Muencheberg, Germany), selected by Soil Science Society of America for this years’ L.R. Ahuya Agricultural Systems Modeling Award (CropM)

B13. Data access: new datasets or data/model assets generated in MACSUR (provide in the annex explanations on the storage: is this centralised or in each group? capture data sharing and evidence for this)


Data may be published and deposited in AgriMod (http://agrimod.org), the Open Data Journal of Agricultural Research (http://odjar.org), created by MACSUR members and the GeoNetwork Archive at University of Aarhus. 11 Datasets in the GeoNetwork Archive will be publicly available once the corresponding data use agreements have been confirmed. JANSEN, Sander et al. (2015) Operational database for storing and extracting data. FACCE MACSUR Reports 6, D-C2.2. Available at: <http://ojs.macsur.eu/index.php/Reports/article/view/D-C2.2>. Date accessed: 26 Aug. 2015.

Many more data sets have been created and are stored decentrally but have not been reported.

B14. Other activities (listed by categories)

B14a New technologies


Kersebaum (during 2013-14) Integration of the HERMES crop growth sub-module into the AMBAV system of the German Weather Service (DWD). (CropM)
B14b Various
Jorgenson, J. (2013) Attended AgMIP development sprint in Wageningen June 19-21, and initiated collaboration efforts regarding model and dataset integration that will encourage the use of standardised protocols and formats. (Hub)

Slawinski, C. (2013) Starting a new experiment in south-east of Poland for gathering highest quality data for calibration and validation of crop models including climate change. (CropM)

Twardy, S. (2013) Under the Project there are gathered data and other information (current and historical) on changes in grass biomass production taking into account the elevation of land above sea level and diversified slope exposures. These materials will be used for a dissertation and developed in the form of scientific publications. Also there is collected data on the quantity and quality of biomass depending on the differentiated frequency of sward use. (CropM, LiveM)


C Networking

C1. Theme or cross-theme meetings
CropM WP leaders meeting. Bonn, Germany. From 12.06.2012 to 13.06.2012 (CropM). Goal: Planning of CropM in MACSUR1
Attendance: 12. Organised by University of Bonn. internal minutes
MACSUR - CropM workshop, Work Packages 1, 2 and 4. From 06.05.2013 to 07.05.2013 (CropM). Goal: Planning Attendance: 27. Organised by CropM - MACSUR.

CropM WP leaders meeting. Sassari, Italy. From 02.04.2014 to 02.04.2014 (CropM). Goal: Regular Meeting for update and further planning Attendance: 8. Organised by University of Sassari. internal minutes
CropM WP leaders meeting. Reading, UK. From 09.04.2015 to 09.04.2015 (CropM). Goal: Regular Meeting for update and further planning Attendance: 11. Organised by University of Reading. internal minutes


Exploring new ideas for trade and agriculture model integration for assessing the impacts of climate change on food security. Haifa, Israel. From 03.03.2013 to 05.03.2013 (TradeM). Goal: Review and discussion of the models involved in analyzing the effects of climate change on food security. Introducing innovative ideas that combine economic models with crops and livestock models Attendance: 100. Organised by NRERC - Natural Resource and Environmental Research Centre, University of Haifa, Israel. http://macsur.eu/index.php/files/MACSUR%20TradeM/TradeM%20Workshop%20Haifa%202013
C2. Consortium meetings (whole MACSUR)


http://ojs.macsur.eu/index.php/Reports/issue/view/1


http://ocs.macsur.eu/index.php/Hub/Midterm


C3. Workshops


http://www.chil.org/profile/spanish.macsur/main


http://www.chil.org/profile/spanish.macsur/main


A series of one-day meetings between partners 139, 158, 162 concerning realization of tasks in CropM module.. Lublin, Poland. From 20.03.2013 to 29.05.2013 (CropM). Goal: Planning. Attendance: 6. Organised by Institute of Agrophysics Polish Academy of Sciences, Lublin, Poland.

Meeting of the TradeM and CropM partners on common research carried out for contribution to MACSUR goals.. Lublin, Poland. From 15.05.2013 to 15.05.2013 (TradeM, CropM). Goal: Planning. Attendance: 5. Organised by University of Technology and Life Sciences in Bydgoszcz, Institute of Agrophysics Polish Academy of Sciences in Lublin, Poland.


C7. Links to national projects or facilities

New collaborations with directorates of 8 secondary schools where workshops and trainings for 8*20=160 students of secondary schools were conducted. There were distributed instructional materials prepared in advance. (CropM, LiveM, reported by S. Twardy, 22.05.2014)
C8. Links created to other EU or international groups
AgMIP, Memorandum of Understanding signed 2014-02-19 (Hub, reported by M. Köchy, 27.05.2014)
Collaboration with agricultural, meteorological agencies and Escuela Politécnica Nacional from Ecuador to
develop a research line on agricultural impacts and adaptation to climate change, with focus on water
resources (CropM, reported by M. Ruiz-Ramos, 21.05.2015)
Eol written with WUR to the FACCE SURPLUS call (CropM, reported by A. Whitmore, 26.05.2015)
Global Research Alliance's Animal Health and Greenhouse Gas Emissions Intensity Network and MACSUR's
Task on Animal Health and Greenhouse Gas Emissions organising a joint workshop for MACSUR 2 (LiveM,
reported by Ş. Özkan, 29.05.2015)
Information on MACSUR2 structure sent to JRC (Hub, reported by M. Köchy, 08.07.2015)
Initiation of collaboration between LiveM and SOLID (Sustainable Organic and Low Input Dairying project)
(LiveM, reported by R. Kipling, 2013)
Working with SEMAGROW to provide data hosting/publishing system using Open Journal Systems, following
attendance at the SEMAGROW meeting in Wageningen June 17-18, 2013 (Hub, reported by J. Jorgenson,
20.06.2013)

C9. Stakeholder interactions
03.06.2014 (Hub)
Bojar, W., Biegnewski, J., Depta, P.: Potential synergic effects between MACSUR models and the UTP team
other models. SYNERGIC EFFECTS ARE ADDRESSED to STAKEHOLDERS:FARMERS, POLITICIANS,
SELF GOVERNMENT AGENDAS, e.g. devoted problem of development of farmer cooperation within the EU
countries. (TradeM)
Dalgaard, T.: Coordinated by the www.dnmark.org research alliance a series of workshops are organized with
local farmers about scenarios for future farming, and methods are reviewed together with other similar
methods applied in MACSUR. (LiveM)
Harstad, O.M.: Utfordringer for husdyrproduksjon i et fremtidig klima (Challenges for livestock production under
changing climate) Bioforsk conference 2014. (National meeting-research, stakeholders,media ). 05.02.2014
(LiveM, CropM)
Höglin, M.: Europeisk landbruk i et klima i endring- MACSUR (European agriculture under changing climate -
(CropM)
Jayet, P.A.: Developments and prospects of farm-level modelling for post 2013 CAP impact analysis. EU
Commission, Brussels. 06.06.2012
Köchy, M., Banse, M.: Meeting with Junge DLG (Young German Farmers Ass.) on climate change impacts on
farming incomes. Braunschweig, 30 pers. 06.03.2015 (Hub)
Lotze-Campen, H.: Meeting with German MP Groneberg on the topics of agriculture, climate change and
agricultural economy. Berlin, Germany. 14.05.2013 (TradeM)
Minet, J.: Presentation of MACSUR activities at the international agricultural event "Foire de Libramont 2013".
30.07.2013 (CropM, LiveM)
Minguez, I., Ruiz-Ramos, M.: Workshop at the Spanish Agency of Meteorology, on Meteo and Climate Services
for Agriculture. Presentation "Crop models and climate projections". 30.05.2013 (CropM)
Palamitnik, R.R.: Meeting with the chief scientist of the Israeli Ministry of Agriculture Dr. Perel to report on the
progress of the project and to check the possibility of Israeli cooperation in Stage II of MACSUR. 24.04.2014
(TradeM)
Roggero, P.P.: Two meetings (December 13, 2013; January 15, 2014) with the governing board of the Arborea
Farmers' Cooperative and some associates were organized aiming to develop further common
understanding on the kind of adaptive strategies suitable at local level, using modelling outcomes as
boundary object to engage dialogue with stakeholders. These activities were developed also in the context of
regional innovation projects that are strongly linked to some key issues of LiveM and that represent a
complementary process to feed the MACSUR follow-up with new scenarios in the context of ongoing
regional pilot studies. 15.01.2014
Roggero, P.P.: Several interviews to different stakeholders (experts, technicians, professionals, "ordinary
people", etc.) aiming to investigate their perception about climate change and the impacts generated by their
activities on this change. These interviews were synthesized in video-spots that were broadcasted during the
MACSUR mid-term meeting held in Sassari on 1-4 April 2014. .. (CropM/LiveM)
Roggero, P.P.: The NRD-UNISS team actively participated to local events and activities organised by different
local actors (Cooperatives, Local Committees, Council etc.) in the regional pilot study area. This participation
aimed at both extending the Macsur exploration of the local dynamics, and contextualizing and better
framing NRD-UNISS research through a bidirectional communication pathway. (CropM/LiveM)
Roggero, P.P.: P62 is interacting with the Italian Ministry of Agricultural Food and Forestry Policies to create the
pre-conditions for a MACSUR-Italy follow-up. A high level meeting will be held shortly to invite policy makers
to recognize the relevance of the knowledge hub in the context of supporting adaptive responses for Italian
agriculture. (CropM, LiveM, TradeM)
Roggero, PP.: Workshop “Adaptation strategies of Italian agricultural systems to climate change”, Cagliari, Italy
in the context of Agroscenari-Macsur. Meeting with Stakeholders including regional and national policy
makers. 150 participants. 19.06.2013 (Hub)
Ruiz-Ramos, M.: Workshop at the Ministry of Economy and Innovation, Spanish Institute of Agricultural
Research. Presentation "The Spanish participation in MACSUR". 22.04.2013 (CropM)
clímáticos, impactos, evidencias, vulnerabilidades y sistemas agrarios". 29.01.2014 (CropM)
Schönhart, M., Schmid, E., Sinabell, F.: Regional Pilot Case Study Mostviertel – AT. Projektpläsentation und
- diskussion FACCE MACSUR. WIFO Wien. 24.03.2014 (TradeM)
Sinabell, F.: JPI FACCE Knowledge Hub Modelle zur europäischen Landwirtschaft. Projektpläsentation und
- diskussion FACCE MACSUR. WIFO Wien. 24.03.2014 (TradeM)

(Agriculture 2030 - national and international trends - an outlook under uncertainty). Agrarforum Exklusiv,
Amt der ÖÖ Landesregierung, Linz. 02.06.2013 (TradeM)

Sinabell, F.: Herausforderungen an die österreichische Agrarwirtschaft (Challenges for the Austrian agricultural
sector). Studentstag Umweltpädagogik, Hochschule für Agrar- und Umweltpädagogik, Wien. 15.01.2013
(TradeM)

Sinabell, F.: Entwicklung der Landwirtschaft - nationale und internationale Trends (Agricultural development
- national and international trends) Wintertagung Fachschule Mistelbach, Mistelbach. 13.01.2013 (TradeM)

60. Wintertagung, Fachtagung Unternehmen Bauernhof, Wieselburg. 13.01.2013 (TradeM)

Slawinski, C.: Seminar for polish funding agencies regarding the participation of polish teams in MACSUR2.
24.06.2014 (CropM/TradeM)

Trmk, M.: Presentation of MACSUR to policymakers at "Agricultural research and food security – Outlook to
Horizon 2020 and beyond Czech contribution to common European effort". 05.06.2014 (CropM)

Twardy, S.: Organic fertilizers management and low-cost pro-environmental pastoral economy in mountain
areas. Meeting with stakeholders in Grywald (Poland, the Krościenko community). 25.07.2012 (LiveM,
CropM)

Twardy, S.: The rational management of mountain pastures under conditions of low-cost means of agricultural
production. 22.07.2014 (LiveM, CropM)

D Capacity building

D2. Training workshops

The art of crop modelling. Quantifying crop growth in face of global food security and climate effects through
modelling tools. From 04.03.2013 to 08.03.2013 (CropM). Goal: Training of PhD students Attendance: 30.
Organised by Wageningen UR.

A beginners seminar on „Ecological Modelling“. From 05.08.2013 to 08.08.2013 (CropM). Goal: Training
Attendance: Organised by Estonian University of Life Sciences.

Modeling climate effects on crops and cropping systems. From 23.09.2013 to 29.09.2013 (CropM).

Goal: Training of PhD students Attendance: Organised by Aarhus University.

MACSUR modelling workshop “Working with dynamic crop models”. From 19.05.2014 to 23.05.2014 (CropM).

Goal: Training Attendance: 34. Organised by ZALF.

Model oriented field experiments for climate change impact assessment. From 10.11.2014 to 13.11.2014

Dynamic land use optimization under global change, University of Natural Resources and Life Sciences; training
by Uwe Schneider (Hamburg University). From 11.03.2013 to 15.03.2013 (TradeM). Goal: This course taught
applied mathematical programming for the assessment of land use decisions, policies, and impacts and
concentrated on the formulation and interpretation of related optimization models. Attendance: 10. Organised
by Institute for Sustainable Economic Development at University of Natural Resources and Life Sciences,
Vienna. Students within and outside MACSUR, mainly TradeM, recieved training in applied programming
modelling including devopment of interfaces to LiveM and CropM themes.

International workshop on "Modelling European Agriculture with Climate Change for Food Security"
From 23.03.2014 to 26.03.2014 (TradeM). Goal: training graduated and PhD students as well as
stakeholders Attendance: 25. Organised by University of Haifa and Zalf, Germany. internal minutes

International workshop: Sustainability assessment of land use scenarios: what needs to be considered and how
can it be done?. Haifa, Israel. From 23.03.2014 to 26.03.2014 (TradeM). Goal: Understand formalized
processes of decision making as well as decision makers needs for evidence. 2. Provide training on
integrated modeling/assessments. For this purpose the Framework for Participatory Impact Assessment
(FoPIA) was introduced to provide an integrated and well-established method that guides experts and/or
decision makers through a policy impact assessment while emphasizing: (i) the development of scenarios,
(ii) the analysis of the regional sustainability context, (iii) assessment of possible policy impacts and
sustainability trade-offs. The case study dealt with the biosphere reserve of Ramat Menashe. . Attendance:
16. Organised by NRERC- Natural Resource and Environmental Research Center, University of Haifa, Israel and ZALF, Germany. The participants submitted working papers with academic literature review and scientific analysis of biosphere reserve of Ramat Menashe.

Integrated land use modelling; Training, held by Mathias Kirchner, Hermine Mitter, Ewin Schmid, Martin Schönhar. From 07.04.2014 to 11.04.2014 (TradeM). Goal: The module aimed at strengthening skills in advanced land use optimization modelling by integrating disciplinary concepts, data, methods and scenarios. The students shall be able to build bottom-up land use optimisation models at farm to landscape scale as well as at regional to global scale and to perform integrated impact analysis of climate change, trade, and policy on agricultural land use, production and environment. Attendance: 11. Organised by Institute for Sustainable Economic Development at University of Natural Resources and Life Sciences, Vienna. Students within and outside MACSUR, mainly TradeM, recieved training in applied programming modelling including devopment of interfaces to LiveM and CropM themes.


D3. Specialist workshops


CAPRI Graphical User Interface (GUI) training. Berlin, Germany. From 18.11.2013 to 18.11.2013 (TradeM). Goal: To enable participants to extract data from the CAPRI model. Attendance: 10. Organised by WIFO.

Modelling interactions between climate and livestock pathogen transmission, Pirbright, UK. From 22.01.2014 to 22.01.2014 (LiveM). Goal: To review the state of the art in disease modelling and develop ideas for collaborative activities. Attendance: 20. Organised by LiveM, Pirbright Institute.


Modelling interactions between climate and livestock pathogen transmission, Pirbright, UK. From 22.01.2014 to 22.01.2014 (LiveM). Goal: To review the state of the art in disease modelling and develop ideas for collaborative activities. Attendance: 20. Organised by LiveM, Pirbright Institute.

Modelling capacities for agricultural policy support in Europe. From 05.06.2012 to 05.06.2012 (TradeM). Goal: Knowledge exchange. Attendance: 22. Organised by Trade-M-ZALF, LIAISE, EC-JRC.

CAPRI Graphical User Interface (GUI) training. From 18.11.2013 to 18.11.2013 (TradeM). Goal: To enable participants to extract data from the CAPRI model. Attendance: 10. Organised by WIFO.

D4. Established scientific staff

<table>
<thead>
<tr>
<th>Institute</th>
<th>Persons</th>
<th>Full-time equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aarhus University</td>
<td>17</td>
<td>88.79</td>
</tr>
<tr>
<td>European Academy of Bolzano</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Forschungszentrum Jülich</td>
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<td>INRA</td>
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<td>Norwegian University of Life Sciences</td>
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<td>20</td>
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<tr>
<td>PIK Potsdam</td>
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<td>18.05</td>
</tr>
<tr>
<td>Technical University of Madrid (UPM)</td>
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<tr>
<td>Thünen Institut</td>
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<tr>
<td>Université de Liège</td>
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</tr>
<tr>
<td>University of Bonn</td>
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<tr>
<td>University of Milan</td>
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</tr>
<tr>
<td>University of Reading</td>
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<tr>
<td>ZALF</td>
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<td>IBERs. Aberystwyth University. UK</td>
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<td>IHAR-PIB. Młochów. Poland</td>
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<td>INRA. France</td>
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<td>MTA Centre for Ecological Research. Hungary</td>
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<td>NRERC. University of Haifa. Israel</td>
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<td>University of Tuscia. Viterbo. Italy</td>
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D7. Research communities in the themes

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<thead>
<tr>
<th>Names of research communities</th>
<th>Level of research community (national, regional, European, international)</th>
<th>Description of interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CropM: Modelling crop rotations</td>
<td>International</td>
<td>Workshops, joint papers</td>
</tr>
<tr>
<td>CropM: Data quality evaluation and labelling for modelling</td>
<td>International</td>
<td>Workshops, joint papers with AgMIP, public available software tool</td>
</tr>
<tr>
<td>CropM: Scaling</td>
<td>International</td>
<td>Workshops, joint papers</td>
</tr>
<tr>
<td>CropM: Impact response surface analysis</td>
<td>International</td>
<td>Workshops, joint papers</td>
</tr>
<tr>
<td>CropM: Model-aided crop ideotyping</td>
<td>International</td>
<td>Workshops, joint papers</td>
</tr>
<tr>
<td>CropM: Tree cropping systems.</td>
<td>International</td>
<td>Review papers, joint papers</td>
</tr>
<tr>
<td>CropM/LiveM/TradeM: Regional case studies</td>
<td>Regional, European</td>
<td>Knowledge exchange, workshop at the midterm conference and the stakeholder workshop in Brussels</td>
</tr>
<tr>
<td>Names of research communities</td>
<td>Level of research community (national, regional, European, international)</td>
<td>Description of interaction</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LiveM: Livestock disease research and modelling</td>
<td>European (with plans for linkage with GRA)</td>
<td>Initial workshop in Pirbright, UK, to discuss the state-of-the-art in the field; exchanges of information and knowledge between Italian, Norwegian and Spanish modelling groups in this area. Identification and initial contact with international institutes active in this area.</td>
</tr>
<tr>
<td>LiveM: Permanent grassland modelling</td>
<td>International</td>
<td>Collaborative efforts developing protocols for model evaluation and inter-comparison (uncalibrated and calibrated runs) and completion of exercises in these areas; Input (and leadership regarding methods employed) to AgMIP grassland group activities. Linkage of community and joint activities with grassland modellers in CropM theme.</td>
</tr>
<tr>
<td>LiveM: Farm-scale modellers</td>
<td>European</td>
<td>Knowledge exchange, inventory of models, model inter-comparison exercise, Joint workshop with TradeM and progress towards assessment of state-of-the-art in farm-scale modelling of livestock systems in Europe.</td>
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<tr>
<td>TradeM: AGMIP</td>
<td>International</td>
<td>TradeM workshop announced in AGMIP</td>
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<tr>
<td>TradeM: AGMIP</td>
<td>International</td>
<td>Joint book plan</td>
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## E Project coordination and management

### E1. Deliverables performed

<table>
<thead>
<tr>
<th>Deliverable ID</th>
<th>Description</th>
<th>Month planned</th>
<th>Month achieved</th>
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<tbody>
<tr>
<td>D-H1.1</td>
<td>Review of the opportunities for using cloud computing</td>
<td>2013-05</td>
<td>2013-03</td>
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<tr>
<td>D-H1.2</td>
<td>Review of models and methods, together with Themes</td>
<td>2013-09</td>
<td>2015-09</td>
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<tr>
<td>D-H1.3</td>
<td>Review of upscaling methodologies</td>
<td>2014-05</td>
<td>2014-05</td>
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<tr>
<td>D-H1.4</td>
<td>Report on model integration approaches</td>
<td>2015-04</td>
<td>2015-04</td>
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<tr>
<td>D-H2.2/D-C6.3</td>
<td>A strategic map for the engagement with national/EU policy maker on adaptation and mitigation</td>
<td>2015-05</td>
<td>→D-C6.3</td>
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<tr>
<td>D-H2.3/D-C6.4</td>
<td>Final version: Strategic map for the engagement of the agri-food chain</td>
<td>2015-05</td>
<td>2013-07</td>
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<tr>
<td>D-H2.4/D-C6.5</td>
<td>A strategy for the dissemination outputs at the national, EU and global levels</td>
<td>2012-12</td>
<td>2013-08</td>
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<tr>
<td>D-H3.1</td>
<td>FACCE MACSUR Website</td>
<td>2015-05</td>
<td>2015-05</td>
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<tr>
<td>D-H3.2</td>
<td>Definition of clear responsibilities</td>
<td>2012-11</td>
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<tr>
<td>D-H3.3</td>
<td>Regular Progress Reports</td>
<td>2015-05</td>
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<td>D-H3.3</td>
<td>Progress report M8</td>
<td>2013-01</td>
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<td>D-H3.3</td>
<td>Progress report M14</td>
<td>2013-08</td>
<td>2013-06</td>
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<td>D-H3.3</td>
<td>Progress report M20</td>
<td>2014-02</td>
<td>2014-06</td>
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<td>Progress report M32</td>
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<td>2014-09</td>
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<td>Final report</td>
<td>2015-05</td>
<td>2015-08</td>
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<td>D-H3.4</td>
<td>Dissemination of the outputs of the network-activities and facilitating collaboration with other relevant European and international organizations and networks</td>
<td>2015-05</td>
<td>2015-05</td>
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<tr>
<td>D-H3.5</td>
<td>Administrative tasks and reports</td>
<td>2014-06</td>
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<tr>
<td>D-C0.1</td>
<td>CropM website</td>
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<td>D-C0.2</td>
<td>Regular (3-monthly) newsletters</td>
<td>2015-05</td>
<td>2015-06</td>
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<td>D-C0.3</td>
<td>Report about the strategy for future research</td>
<td>2015-01</td>
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<td>D-C1.1</td>
<td>List of identified crops and related models</td>
<td>2012-07</td>
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<td>D-C1.2</td>
<td>Data classification and criteria catalogue for data requirements</td>
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<td>D-C1.3</td>
<td>Data format for model in- and output</td>
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<td>Refined model evaluation methods and protocols</td>
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<td>D-C1.5</td>
<td>Results of uncalibrated model runs available</td>
<td>2013-11</td>
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<td>D-C1.7</td>
<td>Regional data set for model inter-comparison</td>
<td>2014-07</td>
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<td>D-C2.1</td>
<td>Final set of compiled experimental data available</td>
<td>2015-05</td>
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<td>D-C2.2</td>
<td>Operational database for storing and extracting data</td>
<td>2013-11</td>
<td>2015-01</td>
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<td>D-C2.3</td>
<td>Protocol for empirical data analyses finalised</td>
<td>2013-07</td>
<td>2013-05</td>
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<td>D-C2.4</td>
<td>Reports on field experimental network meetings</td>
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<td>D-C2.5</td>
<td>Empirical analysis on crop-weather relationships</td>
<td>2015-05</td>
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<td>D-C2.6</td>
<td>Online web tool for data visualisation</td>
<td>2014-11</td>
<td>2015-06</td>
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<td>D-C3.1</td>
<td>Review of scaling methods for different purposes</td>
<td>2014-10</td>
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<tr>
<td>D-C3.2</td>
<td>Inventory of data and data sharing mechanism for model linking and scaling exercises</td>
<td>2014-07</td>
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<td>D-C3.3</td>
<td>Report of scaling methods that have been compared in case studies</td>
<td>2015-01</td>
<td>2014-12</td>
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<td>Report on the comparison of model linking protocols in different test cases</td>
<td>2015-01</td>
<td>2015-02</td>
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<td>D-C4.1.1</td>
<td>Defined terms and typology of uncertainty</td>
<td>2012-09</td>
<td>2013-05</td>
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<td>D-C4.1.2</td>
<td>Framework structure to integrate improved methods for uncertainty evaluation, and protocols for methods application</td>
<td>2013-05</td>
<td>2014-07</td>
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<tr>
<td>D-C4.1.3</td>
<td>Estimates of crop responses to climate change with quantified ranges of uncertainty</td>
<td>2014-05</td>
<td>2015-07</td>
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<td>D-C4.1.4</td>
<td>Communication strategy for uncertainty</td>
<td>2014-11</td>
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<td>D-C4.2.1</td>
<td>Standardised methods and protocols based on current best practices to conduct sensitivity analysis</td>
<td>2014-09</td>
<td>2014-12</td>
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<td>D-C4.2.2</td>
<td>Identification and quantification of differences between models</td>
<td>2014-10</td>
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<td>D-C4.2.3</td>
<td>Quantified evidence of error propagation</td>
<td>2015-05</td>
<td>2015-06</td>
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<td>D-C4.2.4</td>
<td>Information to support input data quality and model improvement</td>
<td>2015-05</td>
<td>2015-06</td>
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<tr>
<td>D-C4.3.1</td>
<td>State-of-the-art scenarios from climate model ensemble simulations (CMIP5) for local/regional applications</td>
<td>2014-09</td>
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</table>

1 Principal researcher with long-term illness

Annexes, p. 55
<table>
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<th>Deliverable ID</th>
<th>Description</th>
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<th>Month achieved</th>
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<td>Local-scale daily climate scenarios</td>
<td>2015-01</td>
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<td>D-C4.3.3</td>
<td>Evaluation of future diurnal variability and projected changes in extremes of precipitation and temperature and their impacts</td>
<td>2015-05</td>
<td>2015-07</td>
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<td>D-C4.4.1</td>
<td>A versatile method for combining probabilistic projections of future climate with crop model sensitivity and uncertainty analysis</td>
<td>2014-05</td>
<td>2014-07</td>
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<td>D-C4.4.2</td>
<td>Further development and operationalization of method for overlaying probabilistic climate projections with impact response surfaces</td>
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<td>D-C4.4.3</td>
<td>Evaluation of different approaches for probabilistic assessment of climate change impacts on crop production</td>
<td>2015-05</td>
<td>2015-06</td>
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<td>D-C4.5.1</td>
<td>Concepts and methods developed for probabilistic evaluation of a number of alternative adaptation options</td>
<td>2015-02</td>
<td>2015-07</td>
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<tr>
<td>D-C4.5.2</td>
<td>Development, operationalization and evaluation of method for probabilistic evaluation of different adaptation options</td>
<td>2015-01</td>
<td>2015-02</td>
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<tr>
<td>D-C4.5.3</td>
<td>Ultra-high yielding wheat ideotypes optimized for future climate change</td>
<td>2015-05</td>
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<td>D-C4.5.4</td>
<td>High yielding and resilient barley and maize ideotypes suited to future climates</td>
<td>2015-05</td>
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<td>D-C5.1</td>
<td>Report on inter-institute exchanges</td>
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<td>D-C5.2</td>
<td>Report of crop and other modelling courses</td>
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<td>D-C5.4</td>
<td>Internet course implementation</td>
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<tr>
<td>D-C5.3</td>
<td>Report on internet course in crop physiology</td>
<td>2015-01</td>
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<td>D-C6.3/D-H2.2</td>
<td>A strategic map for the engagement with national/EU policy maker on adaptation and mitigation</td>
<td>2015-05</td>
<td>2015-07</td>
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<td>D-C6.4/D-H2.3</td>
<td>A strategic map for the engagement with the agri-food chain</td>
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<td>D-C6.5/D-H2.4</td>
<td>A strategy for the dissemination outputs at the national, EU and global levels</td>
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<td>D-L0.1</td>
<td>Agreed co-ordination structure and processes for operation of LiveM</td>
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<td>D-L1.1</td>
<td>Identified relevant datasets</td>
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<td>D/M-L1.2.1</td>
<td>Dataset completed</td>
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<tr>
<td>D/M-L1.2.2</td>
<td>Analysis of inter-annual and seasonal variations of productive, reproductive and health data</td>
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<td>2014-10</td>
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<tr>
<td>D/M-L1.2.3</td>
<td>Relationships between (THI) and dairy cow performances established</td>
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<td>2015-01</td>
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<td>D-L1.3</td>
<td>Identified datasets</td>
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<tr>
<td>D-L1.4.2</td>
<td>List of sources of C-sequestration data identified within Europe</td>
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<td>2014-09</td>
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<tr>
<td>D-L1.4.3</td>
<td>Inventory of C-sequestration dataset meta-data established and available online</td>
<td>2015-05</td>
<td>2014-06</td>
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<td>D-L1.5</td>
<td>Identified uncertainties in climate change prediction</td>
<td>2013-05</td>
<td>2013-06</td>
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<td>D-L2.1.1</td>
<td>A list of models and modelling teams is available</td>
<td>2013-11</td>
<td>2013-10</td>
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<td>Datasets classification and criteria for data requirements</td>
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<td>D-L2.2</td>
<td>Model evaluation protocols</td>
<td>2014-05</td>
<td>2014-06</td>
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<tr>
<td>D-L2.3</td>
<td>Results of uncalibrated model runs</td>
<td>2014-04</td>
<td>2014-06</td>
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<tr>
<td>D-L2.4</td>
<td>Model inter-comparison</td>
<td>2015-05</td>
<td>2015-06</td>
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<td>D-L3.1</td>
<td>Internet database is operational</td>
<td>2013-09</td>
<td>2014-06</td>
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<td>D-L3.1.2</td>
<td>Report on data collection for running and testing farm-scale models</td>
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<td>2014-07</td>
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<tr>
<td>D-L3.3</td>
<td>Review of the applicability and effectiveness of mitigation and adaptation measures</td>
<td>2015-01</td>
<td>2015-01</td>
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<tr>
<td>D-L4.1</td>
<td>Review of regional scale models in the EU, and the methods commonly used when modelling outcomes of climate change mitigation polices</td>
<td>2013-09</td>
<td>2015-06</td>
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<tr>
<td>D-L4.2</td>
<td>Report on stakeholder involvement methodologies</td>
<td>2015-05</td>
<td>2015-04</td>
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<tr>
<td>D-T0.1</td>
<td>TradeM website</td>
<td>2012-06</td>
<td>2012-10</td>
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<tr>
<td>D-T0.2</td>
<td>Clear definition of responsibilities, roles of the partners, an agreement on quality criteria</td>
<td>2013-05</td>
<td>2012-11</td>
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<tr>
<td>D-T0.3</td>
<td>Regular (6-monthly) progress report after the kick-off-meeting, each workshop and the congress</td>
<td>2015-03</td>
<td>2015-05</td>
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<tr>
<td>D-T0.4</td>
<td>Presentations, papers, data, and results of (amended) models</td>
<td>2012-08</td>
<td>2015-05</td>
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<td>D-T1.1</td>
<td>Factsheets of the models</td>
<td>2012-07</td>
<td>2012-09</td>
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<td>D-T1.2</td>
<td>Scenario report</td>
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1 Principal researcher on maternity leave
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<th>Month planned</th>
<th>Month achieved</th>
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<tr>
<td>D-T1.3</td>
<td>Model results and comparison of model outputs</td>
<td>2013-08</td>
<td>2015-04</td>
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<td>Description and analysis of price data consistent with AGMIP scenario</td>
<td>2013-11</td>
<td>2015-04</td>
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<tr>
<td>D-T2.1</td>
<td>Climate dependent yields</td>
<td>2014-05</td>
<td>2015-07</td>
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<td>D-T2.2</td>
<td>Updated database</td>
<td>2014-05</td>
<td>2014-04</td>
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<td>D-T2.3</td>
<td>Climate dependent equilibrium model. Report on model with open source computer code.</td>
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<td>Integration possibilities and eventual contrasts with up-scaling activities in other networks</td>
<td>2015-05</td>
<td>2015-07</td>
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<tr>
<td>D-T2.5</td>
<td>Prototype of stochastic equilibrium model of the food system. Report on model with open source computer code</td>
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<td>2015-04</td>
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<td>Most relevant aspects of climate change in hot-spot analysis</td>
<td>2013-01</td>
<td>2013-07</td>
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<td>D-T3.2</td>
<td>Report identifying storylines and scenario to be the basis for simulations in each hot-spot area</td>
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<td>2013-07</td>
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<td>Identification of models to be applied in each hot-spot area</td>
<td>2013-07</td>
<td>2013-11</td>
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<td>First round of simulations: Report</td>
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<td>2014-11</td>
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<td>D-T3.5</td>
<td>Workshop for discussion of simulation results</td>
<td>2014-05</td>
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<td>D-T3.6</td>
<td>Workshop for discussion of political insights from simulation results</td>
<td>2014-11</td>
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<td>Workshop to present the results stemming from the new round of simulations</td>
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<td>D-T3.8</td>
<td>Publication of a book summarising the obtained research results</td>
<td>2015-05</td>
<td>2014-06</td>
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<tr>
<td>D-T4.1</td>
<td>Curriculum for training course on policy impact assessment</td>
<td>2013-11</td>
<td>2014-06</td>
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<tr>
<td>D-T4.2</td>
<td>Curriculum for training course on agricultural production and environmental modelling with GAMS</td>
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E2. Milestones achieved

<table>
<thead>
<tr>
<th>Milestone ID</th>
<th>Description</th>
<th>Month planned</th>
<th>Month achieved</th>
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<tr>
<td>M-H1.1</td>
<td>Improved integrated modelling activities</td>
<td>2014-11</td>
<td>2014-09</td>
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<tr>
<td>M-H1.2</td>
<td>Advanced achievements in modelling activities</td>
<td>2015-01</td>
<td>2015-04</td>
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<tr>
<td>M-H2.1/H3.1/C6.1</td>
<td>Kickoff meeting</td>
<td>2012-08</td>
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<td>M-H2.2/M-C6.2</td>
<td>Engagement meetings with national and EU policy actors</td>
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<td>M-H2.3/M-C6.3</td>
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<td>M-H2.4/M-C6.4</td>
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<td>M-H2.5</td>
<td>Publication of a book summarising the obtained research results</td>
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<td>M-H3.1</td>
<td>Kickoff meeting of FACCE MACSUR</td>
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<td>FACCE MACSUR progress workshop among theme coordinators</td>
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<td>M-H3.3</td>
<td>Workshop M8</td>
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<td>Workshop M14</td>
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<td>M-H3.5</td>
<td>Mid-term Workshop (Workshop M20)</td>
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<td>M-H3.6</td>
<td>Final Science Conference (Workshop M36)</td>
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<td>M-H3.7</td>
<td>Final Stakeholder Congress</td>
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<td>M-C0.1</td>
<td>CropM Kickoff (M2)</td>
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<td>CropM Progress workshop (M13)</td>
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<td>CropM Progress workshop (M25)</td>
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<td>CropM Final workshop (M36)</td>
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<td>Protocol for model inter-comparison</td>
<td>2012-11</td>
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<td>M-C1.2</td>
<td>Model inter-comparison of uncalibrated results</td>
<td>2013-11</td>
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<td>M-C1.3</td>
<td>Model inter-comparison of calibrated results and sensitivity</td>
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<td>M-C1.4.1</td>
<td>Common workshop on model evaluation</td>
<td>2015-05</td>
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<td>M-C1.4.2</td>
<td>Special issue of a scientific journal on model evaluation</td>
<td>2015-05</td>
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<td>M-C1.5</td>
<td>Model inter-comparison at regional scale</td>
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<td>First set of compiled experimental data</td>
<td>2012-12</td>
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<td>Data scheme of database finalized</td>
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<td>M-C2.3</td>
<td>Protocol prepared and made available</td>
<td>2012-11</td>
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<td>Description of visualisation tools</td>
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<td>Decision on data sharing mechanism for scaling and model linking exercises</td>
<td>2013-05</td>
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<td>M-C3.3</td>
<td>Decision on test cases, aims and upscaling methods to be compared</td>
<td>2013-05</td>
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<td>M-C3.4</td>
<td>Decision on test cases, aims and models to be linked</td>
<td>2013-05</td>
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\(^{1}\) not sufficient contributions
<table>
<thead>
<tr>
<th>Milestone ID</th>
<th>Description</th>
<th>Month planned</th>
<th>Month achieved</th>
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<tr>
<td>M-C4.1.1</td>
<td>Kick-off workshop on the state-of-the-art on uncertainty analysis for crop models</td>
<td>2012-11</td>
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<tr>
<td>M-C4.1.2</td>
<td>Consensus on typology and defined terms, and desired end products</td>
<td>2013-01</td>
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<td>M-C4.1.3</td>
<td>Framework structure, including communication strategy</td>
<td>2013-05</td>
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<td>M-C4.2.1</td>
<td>Kick-off workshop on the state of the art concerning sensitivity analysis for crop models</td>
<td>2012-11</td>
<td>2012-10</td>
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<td>M-C4.2.2</td>
<td>Methods and protocols for sensitivity analysis, including responses to CO2 and extreme temperatures and water stress</td>
<td>2013-05</td>
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<td>M-C4.2.3</td>
<td>Quantified evidence of uncertainty within and between crop models provided by sensitivity analysis</td>
<td>2014-11</td>
<td>2014-11</td>
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<tr>
<td>M-C4.3.1</td>
<td>Accessible probabilistic projections, monthly TEMP and PRECIP changes grid-based (25x 5) over Europe</td>
<td>2013-05</td>
<td>2012-10</td>
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<tr>
<td>M-C4.3.2</td>
<td>Climate scenario workshop to present and evaluate local-scale daily climate scenarios based on the LARS-WG</td>
<td>2014-05</td>
<td>2013-06</td>
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<tr>
<td>M-C4.4.2</td>
<td>Evaluation workshop on probabilistic impact assessment methods (with regional cases)</td>
<td>2015-05</td>
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<td>M-C4.5.1</td>
<td>Session on impact uncertainty as part of overall CropM results workshop</td>
<td>2015-01</td>
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<td>M-C5.1</td>
<td>Scientific exchanges initiated</td>
<td>2012-11</td>
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<td>M-C5.2</td>
<td>Crop modeling courses initiated</td>
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<td>M-C5.3</td>
<td>Internet course initiation</td>
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<tr>
<td>M-C6.1</td>
<td>Kickoff meeting to discuss the case and pilot studies to be utilised</td>
<td>2012-08</td>
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<td>2015-05</td>
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<td>M-L0.1</td>
<td>Annual reports on progress within the Theme</td>
<td>2015-05</td>
<td>2015-07</td>
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<td>M-L1.3</td>
<td>List of required variables and parameters</td>
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<td>2014-03</td>
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<td>M-L1.4</td>
<td>List of papers and reports to be reviewed</td>
<td>2014-05</td>
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<td>M-L1.5</td>
<td>List of uncertainties based on results of workshops</td>
<td>2013-05</td>
<td>2013-06</td>
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<tr>
<td>M-L2.1</td>
<td>A minimum dataset for models is defined</td>
<td>2013-05</td>
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<td>M-L2.2</td>
<td>Workshop: protocol for model evaluation</td>
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<td>M-L2.3</td>
<td>Indicators of model performance are identified and calculated</td>
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<tr>
<td>M-L3.1</td>
<td>Review of farm models and active farm modelling groups</td>
<td>2013-05</td>
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<tr>
<td>M-L3.1.2</td>
<td>Workshop to discuss data collection for testing farm-scale models</td>
<td>2014-09</td>
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<td>M-L3.2</td>
<td>Workshop to discuss farm modelling methodologies</td>
<td>2013-11</td>
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<td>M-L3.3</td>
<td>Workshop to discuss modelling the effect and effectiveness of climate-related policy measures applied at the farm scale</td>
<td>2014-05</td>
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<tr>
<td>M-L4.1</td>
<td>Workshop on regional scale models</td>
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<td>M-L4.2</td>
<td>Workshop on stakeholder involvement methodologies</td>
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<td>Stakeholder workshops on multidisciplinary approaches</td>
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<td>Kickoff meeting (M2)</td>
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<td>Workshop (M18)</td>
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<td>M-T0.6</td>
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<td>Congress (M36)</td>
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<td>M-T1.1/M-T0.1</td>
<td>Start-up workshop</td>
<td>2012-08</td>
<td>2012-09</td>
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<td>M-T1.2</td>
<td>First results of existing models</td>
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<td>M-T1.3</td>
<td>Assessments of existing models</td>
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<td>M-T2.1</td>
<td>Improved integrated modelling activities</td>
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<td>M-T2.2</td>
<td>Advanced achievements in modelling activities</td>
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<td>M-T3.1</td>
<td>Decisions taken regarding the simulations in each hot-spot area.</td>
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<td>M-T4.1</td>
<td>Training course on policy impact assessment announced</td>
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<td>Training courses on policy impact assessment finalised</td>
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<td>Training courses on agricultural production and environmental modelling with GAMS finalised</td>
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