



EUROPEAN RESEARCH EXECUTIVE AGENCY (REA)

REA.C - Future Society
C.3 - Widening Participation



Sustainable Agriculture | Natural Resources

Report of the Cluster Meeting on
Sustainable Agriculture and Natural Resources

**Online event held on the 20th of May 2021,
organised by the European Research Executive Agency (REA),
Unit C3, Widening Participation**

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Executive summary

The European Research Executive Agency (REA) organized an online cluster meeting on the 20th May 2021 with the title: “*Sustainable Agriculture and Natural resources*”. Fifty H2020 projects in this research domain contributed to the meeting by presenting and discussing knowledge needs and possibilities for cooperation.

The H2020 programme “Spreading Excellence and Widening Participation” is the starting point of this cluster meeting. Projects funded in this programme are coordinated in Widening countries, which are identified as “low R&I performing” countries: 15 Member States and 12 Associated Countries. The programme includes three actions: Twinning, Teaming and ERA Chairs. In total 50 projects participated in the meeting, 27 projects from the Widening programme, 3 COST actions in this scientific domain and 20 projects managed in other relevant programmes. The meeting included speakers from DG AGRI, DG RTD and external speakers to explain the policy context of this research area.

Projects presented and discussed their research focus in parallel sessions and discussed potential cooperation. Based on a questionnaire for attending project representatives, an inventory was made of the knowledge and expertise needs of projects for future development and cooperation in new consortia. Projects expressed the need to include knowledge and expertise in the following categories:

- Expanding regional spread;
- Contacts with stakeholders;
- Scientific/technical expertise;
- Access to laboratory facilities;
- Knowledge and expertise in implementation and impact.

Within each of these categories, projects expressed their specific needs and capacity, showing a substantial match between the knowledge and expertise needs of some projects and the availability of this knowledge in other projects. This indicates that there is potential for synergies and cooperation between projects/consortia.

Especially the wish to expand contacts with stakeholders, the wish to have access to specific scientific knowledge/techniques and access to knowledge on implementation and impact, have been mentioned frequently by projects.

In the parallel sessions, a substantial part of the discussion included the following topics:

- The demonstration of good practices, concrete and knowledge co-creation experiments such as ‘Living Labs’ and ‘Lighthouses’ was considered particularly promising, calling for a strengthened cooperation among all key actors in the field;
- Economic quantification of innovations to assure sustainability of solutions;
- Further development of information technological solutions such as sensor development and AI, especially the combining precision agricultural technologies with novel agroecological practices, inspired by ecological principles;
- The involvement of farmers and other stakeholders is essential in the understanding optimized solutions in agroecological processes;
- Integration of scientific methodologies, such as in genomics/ phenomics, vegetal breeding and ecosystem services, and the potential of plasma agriculture;
- The need to enhance data sharing on open platforms, where, in spite of years in promoting open data and data sharing paradigms, a significant gap in data sharing essentially due to policy barriers still exists.

Overall, the Cluster meeting has provided an interesting overview of EU policies in the domain of *sustainable agriculture and linked natural resources* and demonstrated interesting complementary knowledge and expertise across projects, which can lead the way to more synergy, innovative ideas and new project consortia.

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1. SCOPE OF THE MEETING

1.1. Background

The organisation of cluster meetings has been identified as a priority in Policy Feedback activities by REA/C3 (*Widening Participation*) in close collaboration with RTD/A2 (*ERA Governance and Implementation*). Thematic clustering of projects and cluster events aim to facilitate networking opportunities for projects and provide relevant information for EU (research) policies.

The H2020 programme “Spreading Excellence and Widening Participation” is the starting point of this cluster meeting. Projects funded in this programme are coordinated in Widening countries, which are identified as “low R&I performing” countries: 15 Member States and 12 Associated Countries. The programme includes three actions: Twinning, Teaming and ERA Chairs.

There is significant evidence indicating that economic growth and competitiveness is largely connected to research and innovation. To tap into Europe’s yet unexploited potential in research and innovation in Widening countries, a stronger participation in Horizon 2020 coupled with greater commitment by the low-performing Member States and Associated Countries can be instrumental. This focus will enable the European Research Area to function in a more streamlined and homogeneous way, where the individual strengths of every Member State and Associated Country may be optimised.¹

It is considered that participation in the EU Framework Programmes is increasingly dependent on networking and staying connected with partners across the EU.

The H2020 Widening programme provides funding to Coordination and Support Actions (CSAs). These projects aim to enhance the profile of the coordinating institute in the Widening country by knowledge exchange through cooperation with advanced institutions. In order to increase the competitiveness of these coordinating institutions, participation in thematic calls is instrumental. Expanding cooperation with high-level partners in the field can further increase the participation of institutions in Widening countries in future Horizon Europe (HE) calls for funding.

1.2. Focus of the cluster meeting

The Widening programme is *bottom-up* and therefore calls are not based on predefined scientific fields. A portfolio analysis of H2020 Widening projects, managed in REA/C3 (i.e. projects in Spreading Excellence and Widening Participation calls, *SEWP* projects) showed a good representation of projects in the fields of Agriculture/Forestry/Biodiversity including some projects explicitly focussing on ‘soil’. Out of 295 H2020 funded Widening projects, 88 projects focussed on this research domain (see figure 1).

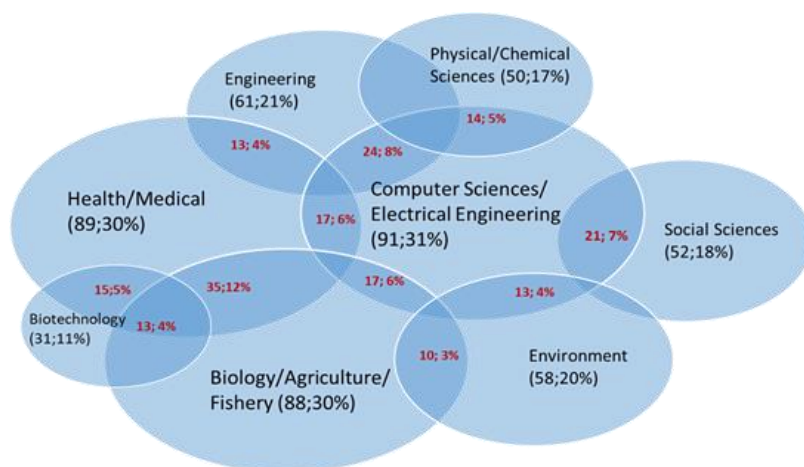


Figure 1. Venn-diagram representing the distribution of 295 H2020 SEWP projects over scientific domains, showing the number of projects and the percentage of total. The numbers in red colour represent the multidisciplinary projects.

¹https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-sewp_en.pdf

In this scientific area, other Units in REA manage relevant projects including those that will be responsible for implementation of Horizon 2020 SC2 (Societal Challenge) and part of SC5 legacy and Horizon Europe Cluster 6 (REA Units B2, B3 and B4). These scientific domains are therefore very well represented in projects managed in REA, which may provide excellent opportunities to seek for synergies, such as future collaboration.

The focus of the Cluster meeting is further specified by the policy priorities set for the EU, i.e. the EU Mission in the area of '*Soil health and food*' and the relevant *Sustainable Development Goals* (SDGs)², which are linked to the wider goals of the '*Green Deal*' (see paragraph 2).

1.3. Aim of the meeting

The meeting aims to facilitate networking between projects to find synergies and possible cooperation and provide policy feedback.

More specifically, the cluster meeting aims:

- To facilitate networking among projects and its institutions in the field of 'sustainable agriculture and linked natural resources', which will foster future collaboration in new consortia. Potential synergies among projects can be either resulting from common or complementary research activities/methodologies;
- To identify emerging topics and knowledge development needs in the field of research;
- To provide information to attendees about EU (research) policies and upcoming opportunities in Horizon Europe.

1.4. Practical set up

The meeting took place on the 20th of May as an online meeting using Webex. The agenda included mostly plenary sessions and breakout sessions for in depth discussions (see Annex). The breakout sessions were guided by a rapporteur (one of the project coordinators) and a moderator (REA staff). Rapporteur for the complete meeting has been Dr. Alessandra Gorla (Sustainability Advisor and Economics Professor, IIS Cattaneo, Milan and LIUC University, Castellanza).

Attendees were project representatives, Commission staff, REA staff and external speakers. The agenda included introductions and keynote speakers by Commission and REA staff. In total 55 projects were invited to join the cluster meeting of which 5 projects did not attend. Two projects presented their work in keynote presentations and 22 projects have been presented in the breakout sessions with short presentations following a fixed format. Next to the projects from the SEWP programme, also other key projects have been presented in the meeting related to this scientific domain, including 3 COST actions and projects in the domains of Societal Challenge 2 (H2020) and Cluster 6 (HE). About half of the attending projects have been SEWP projects. See Annex for project acronyms and project numbers.

In order to facilitate the networking among projects, all attendees received an information package including all projects that attended the meeting with contact details (provided that informed consent was given). For this, a 'Data Protection Notice' was developed and shared with the attendees. In preparation of the meeting, a Survey was sent to all attendees with questions for informed consent for the use of personal data and questions for networking. For networking purposes, questions have been asked about:

1. The knowledge and expertise that consortia would like to include in their network which they do not have readily available yet (referred to as '**Needs**'), and
2. The knowledge and expertise that consortia are willing to share with other institutions/projects (referred to as '**Offers**').

² https://ec.europa.eu/commission/presscorner/detail/en/IP_16_3883

2. POLICY CONTEXT

The focus of this cluster meeting fits well in some of the important policy directions of the EU for the coming years. The *European Green Deal*³ already provides the wider context with a broad roadmap of collective actions to transform the EU economy and society into the first climate-neutral continent by 2050. It includes an extensive set of EU policies and measures across all EU policy areas including food and agriculture, production and consumption, digital transformation, etc. Research and Innovation are at the heart of the initiative with the intention to dedicate 35% of the Horizon Europe budget to the goals of the European Green Deal.

The topics in sustainable agriculture and management of related natural resources are directly relevant for some of the strategies in the European Green Deal, such as the Biodiversity strategy⁴ and 'Farm to Fork' strategy⁵.

The relevant R&I policy context for this meeting is mainly reflected in *Societal challenge 2* of the Horizon 2020 Framework Programme (Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy) and in Cluster 6 and the *Mission on Soil Health and Food* of the new Horizon Europe Framework Programme.

Cluster 6 in Horizon Europe focusses on Food, Bioeconomy, Natural Resources, Agriculture and Environment.⁶ About 8.9 billion Euro is available for Cluster 6 activities in Horizon Europe (out of approximately 95.5 billion total budget). Several strategic areas are especially relevant for the focus of our cluster meeting, defined as 'Impacts' such as: Impact 2: *Preservation and restoration of biodiversity and ecosystems*, Impact 3: *Sustainable and circular management of natural resources; tackling pollution; bioeconomy*, and Impact 4: *Food and nutrition security for all from sustainable food systems from farm to fork*.

The Mission Soil Health and Food⁷, with the motto *Caring for Soil is Caring for Life*, includes many strategies that are relevant for sustainable agriculture and the management of linked natural resources. It aims to combine research and innovation, education and training, investments and the demonstration of good practices using "living labs" (experiments and innovation in a laboratory on the ground) and "lighthouses" (places to showcase good practices). By 2030, 75% of soils in each Member State should be either healthy or in a much better condition, which is also related to its agricultural use, biodiversity, water etc.

³ https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en#:~:text=%20Delivering%20the%20European%20Green%20Deal%20%201,transition%20presents%20a%20major%20opportunity%20for...%20More%20

⁴ https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en

⁵ https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_en

⁶ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-6-food-bioeconomy-natural-resources-agriculture-and-environment_en

⁷ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/missions-horizon-europe/soil-health-and-food_en#:~:text=The%20importance%20of%20soil%20health%20and%20food%20Land,biodiversity%20or%20for%20cycling%20nutrients%20and%20regulating%20climate.

3. OPPORTUNITIES FOR COOPERATION

In response to the networking questions in the EU Survey, consortia expressed their **needs** for knowledge and expertise and also the knowledge and expertise in their project that they are willing to share. This resulted in a 'mapping', which intends to reveal matches between wishes to get access to knowledge and expertise in one project with existing knowledge in another project. This qualitative analysis aims to show opportunities for synergies and cooperation.

In total 36 projects completed the information regarding 'knowledge and expertise needs' and 39 projects filled in the question on knowledge and expertise they can share with other partners/consortia.

The answers to these two questions have been categorised according to the expressed 'knowledge and expertise needs'. The following categories have been identified: 1. Expanding regional spread; 2. Contacts with stakeholders; 3. Scientific/technical expertise; 4. Access to laboratory facilities; 5. Implementation and impact knowledge and expertise. For each of these categories, typical formulations of the knowledge and expertise needs are listed and an approximation of the number of projects/consortia is indicated (the variation in formulation left some room for interpretation and therefore we speak of approximate numbers). Additional information is provided from the discussions in the breakout sessions.

Please note that the offered knowledge and expertise is wider than what is presented in the tables in the next paragraphs, which take the expressed needs as starting point. For a full overview, please consult the table with expressed needs and offers on the Webpage for Widening (under construction in July-August 2021)⁸.

3.1. Expanding Regional spread

In the answers to the networking questions in the survey, about 10 projects expressed the wish to expand their activities in a wider geographical area and/or specific regions. Table 1. Indicates the comments in the questionnaire and the matching expertise in the projects that attended the meeting.

Table 1. Knowledge and expertise related to regional spread.

<i>'Needs' expression in the survey (approx. 10 projects)</i>	<i>Matching expertise (potentially 27 projects)</i>
Regional spread	Potentially all 27 projects coordinated in institutions in Widening countries
Cooperation in Central-Eastern Europe	18 projects coordinated in central-eastern European countries: Bosnia-Herzegovina, Bulgaria, Czech Republic, Hungary, Poland, Serbia, Slovakia and Slovenia

Many of the Widening projects did not explicitly express the wish to contribute to projects based on the fact that they are active in Widening countries, but clearly some of the wishes to expand the regional spread could be covered by the inclusion of institutes in the Widening countries.

⁸ https://rea.ec.europa.eu/funding-and-grants/horizon-europe-widening-participation-and-spreading-excellence_en

3.2. Contacts with stakeholders

In the answers to the networking questions in the survey, at least 15 projects expressed the wish to get in contact with stakeholders not yet in their network. Table 2. Indicates the comments in the questionnaire and the matching expertise in the projects that attended the meeting.

Table 2. Knowledge and expertise related to stakeholder contacts.

<i>'Needs' expression in the survey (approx. 15 projects)</i>	<i>Matching expertise (potentially 12 projects)</i>
Stakeholder contacts, not specified	Consumer behaviour; Cooperation network of policy makers and diverse stakeholders; Regional network (East Mediterranean Middle East region)
Contacts with farmers' associations, relevant NGOs, primary sector	Contacts with regional producers; access to and cooperation with farmers; Capacity building for stakeholders
International contacts in the private sector, industry	Regional network with agri-food SMEs; Transnational cooperation; Acceleration in digital farm
Service providers in agriculture	Technology transfer; Soil ecosystem services; Innovation in the agri-food sector
Rural development networks	Multi-actor platforms
Investors, business cooperation	Forest production; Multi-actor networks

These knowledge and expertise needs are relevant for the wish to implement a quadruple helix approach in EU activities, including cooperation between knowledge institutes/universities, industry, government and public (e.g. farmers, consumers).

Several issues related to improving the impact of sustainable agriculture research have also been discussed in the breakout sessions. First of all, the participants highlighted the need to develop innovative communication methods to engage different stakeholders and to accelerate the uptake of research results in business and policy, since the successful implementation of new practices, policies and cooperation goes hand in hand with effective dissemination, communication, and exploitation of the projects outcome. In particular, several attendees emphasized the need to strengthen cooperation with industry for technological development and commercialization, stressing at the same time the need to enhance capacity building and training of policy makers to overcome policy barriers and enable cross-fertilization, integration and better use of synergies across projects. One very important consideration for discussion was the need to be close to farmers and train them, to facilitate their acceptance and implementation of sustainable agriculture practices. A crucial open issue in this regard, still, is how to convince farmers to adopt more costly technologies and consumers to buy more expensive sustainable food products.

Moreover, the need for a higher involvement of the civil society and the youth was raised in the discussion, jointly with the consideration to adapt the communications tools and strategies to the different target groups. From the perspective of supporting the transition to a circular bio-economy based on knowledge sharing and cooperation, the goal of strengthening environmental sustainability and sustainable agriculture while promoting growth and job creation in rural areas

was also put forward. In this regard, stakeholders' capacity building activities, thematic working groups and digital open access platforms were presented as effective instruments to develop a common bio-economy strategy in Europe.

Overall, it was noted that, in order to make this multi-actor and co-creation approach effective, more time, interactive communication, training and expertise are needed, and should be reflected at the start in the project conception and design.

3.3. Scientific/ technical expertise

In the answers to the networking questions in the survey, about 20 projects expressed the wish to cooperate/expand their knowledge and expertise in specific scientific fields not yet readily available in their consortium and network. Table 3. Indicates the comments in the questionnaire and the matching expertise in the projects that attended the meeting.

Table 3. Knowledge and expertise related to scientific and technical expertise.

<i>'Needs' expression in the survey (approx. 20 projects)</i>	<i>Matching expertise (potentially 22 projects)</i>
Sensor technology	Sensors for agrifood; Remote sensing technology; Earth observation; Satellites, UAVs (unmanned aerial vehicles i.e. "drones"), probes and sensors
Food technology	Food technology, food and agricultural products metrology; Crop physiology; Food processing
Soil biodiversity; Nuclear magnetic resonance (NMR) of soils; Chemical composition of soils	Analytical infrastructure (GC-Q TOF, LC, Maldi-Tof, NMR, AAS, LC-MS Triple Quad); Soil ecology; Symbiosis; Biofertilizers; Plasma application; Nitrogen and ammonia emission
Phenomics and genomics, metagenomics, nutrigenomics	Phenotypic knowledge and technology; Plant phenotyping; Plant biochemistry; Agrodiversity toolbox; Crop growth modelling; Metabolomics
Radiocarbon dating	Studying human-environmental systems (HES) of the Anthropocene
AI application	Sensors for robotics; AI-vision systems, laser targeting systems, autonomous robot controllers, robotic platforms

'Needs' expression in the survey (approx. 20 projects)	Matching expertise (potentially 22 projects)
Data processing and modelling: e.g. big data, machine learning	Data management and tools; DSS for Agriculture; Irrigation scheduling; climate modelling; Bioinformatics; geospatial technology; Groundwater flow modelling; IoT-generated data processing; Digital innovation; Modelling in micrometeorology

The wish to include specific knowledge and expertise varies across the projects as indicated above. For many of those topics there is ample knowledge in the pool of projects in the meeting. For example on sensor technology and AI application and soil biodiversity there is specialised projects that could provide this knowledge.

In the breakout sessions, several scientific/technological topics have been discussed as important future developments. With regard to agriculture digitalization, hot topics discussed include the development of data-driven digital solutions for the agri-food domain, the development of novel sensors, remote sensing, satellite imaging and Artificial Intelligence tools and applications, such as actuators and robots for weed control. Gaps are still evident in the availability of sensors and sensing devices allowing for monitoring of various plant-, soil- or environment-specific parameters. Often combined with the discussion about the availability of large and representative data sets needed for the training of newly developed AI algorithms, and in the scaling-up of AI, which requires the development of block-chains across the whole agri-food system and the implementation of integrated systems solutions. Related to this topic, the challenge of combining precision-agricultural technologies with novel agroecological practices, inspired by ecological principles, such as strip cropping, organic farming and biocontrol agents, was also addressed. The discussion further put forward the development and identification of biocontrol agents.

The need for a better interaction and integration across disciplines and for a real multi-disciplinary approach to sustainable agriculture - bringing together biology, agriculture, food technology and economics - also called for a better *integration of methodologies*, as well as the development of new ones. It was discussed how, in order to develop and implement innovative solutions for sustainable agriculture, integration must be realized both at the field level - integrating novel technologies with socio-economic considerations locally - and at the broader level, scaling-up to more complex systems.

Focusing on scientific knowledge, the need to improve and share specific scientific expertise, such as in genomics/ phenomics, vegetal breeding and ecosystem services, and to explore the potential for plasma agriculture, identifying contexts where plasma agriculture can be applied, was discussed, pointing to the need to share expertise in developing different programs of soil sustainability, crop yields and plant improvements.

At the basis of these emerging research topics the following data issues were highlighted:

- The need to expand EO (Earth Observation) data and collect data on biodiversity to enable predicting soil health.
- The need to couple data bases, combining agronomic data with soil biodiversity data.
- The challenge to merge agroecological databases with socio-economic data, harmonizing data across space and time. This fits into the broader challenge of developing an integrated systemic approach to sustainable agriculture, linking soil health indicators to actual management practices to provide farmers and land managers with the appropriate tools to support decision making.
- The need to improve skills and share expertise on data management. As the sustainable agricultural sector continues to digitalize, more and more data are collected necessitating

improved data management planning. It is especially important that data management plans are jointly defined within the research community, include metadata and enable the reuse of data, support sharing and co-creation of new knowledge. Only in this way AI tools like Machine Learning can be successfully applied and add to the exploitation potential of project results.

3.4. Access to laboratory facilities

In the answers to the networking questions in the survey, at least 8 projects expressed the wish to have better access to laboratories. The nature of these labs was in general not specified in the answer in the survey. Overall this topic was not elaborated on and about 5 projects indicated that lab facilities can be shared.

The topic has not been addressed explicitly in the discussions in the breakout sessions.

3.5. Implementation and impact knowledge and expertise

In the answers to the networking questions in the survey, at least 10 projects expressed the wish to have access to specific implementation knowledge and practices. Table 4 indicates the comments in the questionnaire and the matching expertise in the projects that attended the meeting.

Table 4. Knowledge and expertise related to implementation and impact.

<i>'Needs' expression in the survey (approx. 20 projects)</i>	<i>Matching expertise (potentially 18. projects)</i>
Living laboratories approach	European Network of Living Labs; Participatory approaches; Agricultural Knowledge and Innovation Systems (AKIS); Best practices in demonstration farm
Democratise scientific results	Safety and social acceptability of novel plant breeding techniques; Consumer behaviour; Early warning systems; Social sciences; Knowledge dissemination
Governance analysis, policies	Decision support tools; Climate change adaptation
Transnational policies and legislation	Transnational cooperation; GM Crops; Agroecological transition; Placing the bioeconomy on the political agenda; Inclusion of different European regions

<i>'Needs' expression in the survey (approx. 20 projects)</i>	<i>Matching expertise (potentially 18. projects)</i>
Economic modelling/evaluation of measures, impact	Evaluation of the effects of the CAP, agri-environmental policies; econometrics; economic analysis of plant sciences innovations; LCIA (life cycle impact assessment) agricultural water management; Food system holistic perspective along the value chain; Economics and policies; Analysis of farming systems; Impact of Bioeconomy on national economies; Experimental economics; Impact of air pollution
Promote employability	Staff exchange and training practises

Implementation practices have been part of the discussions in the breakout sessions. The enhancement of technological innovation emerged as a key factor to improve and share a better understanding of the agroecological food system. In particular the need to implement more innovative technological experiments, through tests and demonstration farms, and then to scale-up to real-world solutions pilots in novel sustainable agriculture technologies were presented as key challenges.

The discussion in the breakout sessions further indicated the importance of the quantification of costs and benefits of novel agroecological practices, aiming to keep precision technologies and sustainable agricultural processes economically sensible. This led to discuss the opportunity to develop innovative business models - moving from traditional knowledge to shared knowledge, and ownership and service contracts - to support technological innovation and sustainable agricultural practices from an integrated perspective. The better integration of the socio-economic dimension in the assessment of sustainable agriculture and ecosystem services clearly emerged as a priority, also within the overall goal of developing an integrated assessment of sustainable agriculture accounting for potential synergies/trade-offs between land use in sustainable agriculture and climate change mitigation and adaptation goals. The discussion indeed placed sustainable soil management in the context of the SDGs, pointing to the need of assessing and mitigating trade-offs between SDGs, including sustainable food production, mitigation and adaptation to climate change, urbanization and biodiversity.

Several implementation related aspects were further highlighted in the discussion. The need to harmonize data protocols and standards, aligning national legislations and practices with transnational policy objectives in sustainable agriculture. The need to enhance data sharing on open platforms, where, in spite of years in promoting open data and data sharing paradigms, a significant gap in data sharing essentially due to policy barriers still exists. The demonstration of good practices, concrete and knowledge co-creation experiments such as 'Living Labs' and 'Lighthouses' was considered particularly promising, calling for a strengthened cooperation among all key actors in the field.

4. CONCLUSION AND DISCUSSION

The cluster meeting on Sustainable Agriculture and Natural Resources aimed to provide a policy context and facilitate the identification of possible synergies between projects/consortia. Attendance of the meeting has been very good (90% of invited projects) and we had an interesting collection of high-level presentations by DG AGRI, DG RTD and external speakers to give an overview of the policy context in the domain of Sustainable Agriculture and Natural Resources.

Based on the results of the questionnaire (EU Survey) and the discussions in the breakout sessions, several topics have been identified for future cooperation in support of the research policy goals. In the 'knowledge and expertise needs' expressed by projects, the following categories have been identified: 1. Expanding regional spread; 2. Contacts with stakeholders; 3. Scientific/technical expertise; 4. Access to laboratory facilities; 5. Implementation and impact knowledge and expertise. Within each of these categories, projects expressed their needs and there was substantial match with projects that indicated to have the knowledge and expertise readily available in their consortium. Especially the wish to **expand contacts with stakeholders**, the wish to have **access to specific scientific knowledge/techniques** and access to knowledge on **implementation and impact** have been mentioned frequently by projects.

In the discussion in the breakout sessions, the enhancement of networking, as a core activity of most of the projects participating in the Cluster Meeting, was considered essential. This included the exchange, acceleration of transfer and adoption of best practices to bring innovative products and services closer to society, to prepare novel research proposals and to boost institutional change. The expansion of networks to involve more participants from the biology, agriculture and food technology domains was suggested. Novel tools, such as 'Living Labs' and 'Hubs', were seen also as important opportunities for gathering, sharing ideas and networking. Besides developing innovative partnering tools, an increased knowledge and awareness of the tools already available, i.e. existing platforms, was deemed very important. To the same extent, sharing and expanding existing databases on common platforms - combining data on soils, plants, biodiversity, healthy diets with socio-economic data - was considered desirable.

A number of opportunities for strengthening cooperation in research were presented and discussed. Potential synergies emerged in particular with regard to: the development of digital technologies for precision agriculture; the combination of scientific knowledge on precision agriculture and soil ecology; 'spreading science' through training courses and summers schools; and sharing demonstration tests experiments and field work results for upscaling scientific knowledge. Furthermore, cooperation was considered in creating Digital Innovation Hubs pointing out to exploiting synergies in scientific competence, end-user testbed and business support provision; the development of more effective communication strategies and innovative tools able to reach and engage all relevant stakeholders, including civil society and final consumers of sustainable agricultural products; and spreading impacts to international stakeholders.

More specifically, a substantial part of the discussion included the following topics:

- The demonstration of good practices, concrete and knowledge co-creation experiments such as 'Living Labs' and 'Lighthouses' was considered particularly promising, calling for a strengthened cooperation among all key actors in the field;
- Economic quantification of innovations to assure sustainability of solutions;
- Further development of information technological solutions such as sensor development and AI, especially the combining precision agricultural technologies with novel agroecological practices, inspired by ecological principles;
- The involvement of farmers and other stakeholders is essential in the understanding optimized solutions in agroecological processes;
- Integration of scientific methodologies, such as in genomics/ phenomics, vegetal breeding and ecosystem services, and the potential for plasma agriculture;
- The need to enhance data sharing on open platforms, where, in spite of years in promoting open data and data sharing paradigms, a significant gap in data sharing essentially due to policy barriers still exists;

Participants emphasized that tools can be optimized, and called for a reinforcement of the instruments for cascade funding to maximize the projects impacts. The need to further discuss and comment on future research topics and networks was put forward. Participants also suggested to add on the value of networking by mapping existing networks and building upon them. It was stressed that European scientists should be encouraged to make their results more visible, therefore clustering or thematic meetings would be ideal venues for networking, and having a common platform for the discussion of these opportunities would be desirable. Building on very good experiences from the Teaming Club - where all funded Teaming 2 projects (i.e. action in the Widening programme) meet on a regular basis, discuss the upcoming challenges and discover new ways for collaboration.

In the panel discussion on networking activities (in the afternoon with representation of the National Contact Points, see Annex for the programme), participants were encouraged to improve exchange and collaboration with the EC National Contact Points (NCP). This cooperation can provide support to stakeholders, including applicants and beneficiaries, in the development and implementation of research proposals, including topics such as visibility, the fight against brain drain and the promotion of excellence across Europe. The proposal to fund specific actions on meta-networking was also advanced by participants, along the lines of this Cluster Meeting initiative.

This cluster meeting included a selection of 50 H2020 projects (and COST actions) in the domain of sustainable agriculture and linked natural resources. This represents only a small portion of EU projects in this domain. In that sense, we may consider that the focus of this cluster meeting was not only the scientific domain but also the involvement of Widening countries. Next to that, we also need to consider the size of interactive meetings like this. Despite the fact that a lot of relevant projects were not invited to this meeting, it can be considered a starting point for further networking. The Information package for participants including expressed needs for knowledge and expertise, will be available on the Webpage for Widening (under construction) with the opportunity to add information for further networking.

The current tool in the Participant Portal of Horizon Europe to find partners, is rather general and may not be as effective as creating a community of projects around a theme and have direct interaction, like in this cluster meeting. To effectively build on new ideas and consortia for new calls and to cross-fertilise topics and regions, this meeting provided some basic first steps in getting projects connected. The follow-up of the further exploration of synergies is mainly depending on the coordinators and partners of the projects involved.

5. ANNEXES

Sustainable Agriculture | Natural Resources

Cluster meeting “Sustainable Agriculture and natural resources”

Date: **20 May 2021**
Location: Online event
Organisation: European Research Executive Agency (REA), Unit C3
Chair of the day: Ales Fiala (Head of Unit REA/C3)

Agenda

09:30 – 09:45 Welcome words by **Marc Tachelet** (Director REA), **Nathalie Sauze-Vandevyver** (Director DG AGRI/B), **Patrick Brenier** (Advisor RTD/A)

09:45 – 10:00 Horizon Europe Cluster 6 explained; **Marc Duponcel** (Head of Sector DG AGRI/B2)

10:00 – 10:15 Challenges and needs in sustainable agriculture; **Frits van Evert/Hein ten Berge** (Wageningen University & Research, the Netherlands, Partner in Teaming 2 project ANTARES)

Allocation to parallel sessions

Parallel sessions

Meeting rapporteur: **Alessandra Gorla** (Sustainability Advisor and Economics Professor, IIS Cattaneo, Milan and LIUC University, Castellanza)

Short project presentations and discussion in 3 breakout sessions in the topics:

- 10:20 – 11:50**
- 1. Innovative technologies in agriculture**
Session rapporteur: **Vesna Bengin** (project ANTARES)
Session moderator: **Agne Dobranskyte-Niskota** (REA/C3)
 - 2. Sustainable management of natural resources**
Session rapporteur: **Biljana Basarin** (project EXTremeClimTwin)
Session moderator: **Barbara Mester** (REA/C3)
 - 3. Implementing new practices, policies and cooperation**
Session rapporteur: **Andreja Kutnar** (project InnoRenew CoE)
Session moderator: **Ioanna Stavridou** (REA/C3)

11:50 – 12:05 Back to main session + coffee break

12:05 – 12:45 Discussion, including reporting from each breakout session

12:45 – 14:00 LUNCH BREAK – including:
13:15 – 13:45: Informal optional session for networking; moderator: **Alessandra Gorla** (meeting rapporteur)

Agenda continued:

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| 14:00 – 14:15 | Welcome words by Ales Fiala (Head of Unit REA/C3); Kerstin Rosenow (Head of Unit DG AGRI/B2); Manuel Aleixo (Acting Head of Unit RTD/A2) |
| 14:15 – 14:30 | “Caring for soil is caring for life” - Horizon Europe Mission on Soil health and Food explained; Marta Pogrzeba (Mission Board Member; Institute for Ecology of Industrial Areas, Katowice, Poland) |
| 14:30 – 14:45 | Presentation SMS project: Paving the way for sustainable soil management; Michael Löbmann (Leibniz Centre for Agricultural Landscape Research, Germany) |
| 14:45 – 15:00 | Presentation of BIOEASTsUP project: Advancing Sustainable Circular Bioeconomy in Central and Eastern European Countries; Magdalena Borzecka (Institute of Soil Science and Plant Cultivation, Pulawy, Poland) |
| 15:00 – 15:20 | COFFEE BREAK |
| 15:20 – 15:45 | Funding opportunities in Horizon Europe; Stefan Weiers (head of Sector DG RTD/A2) |
| 15:45 – 16:15 | Panel discussion on future networking: Patricio Ortiz de la Torre (Head of Sector REA /C3); Stefan Weiers (Head of Sector RTD/A2); Katarzyna Walczyk-Matuszyk (NCP Network) |
| 16:15 – 16:30 | Final comments and closing |

Projects in the meeting. In addition, two projects presented as keynote speakers: BIOEASTsUP and SMS.

Proposal Number	Acronym
669062	BioEcon
691998	SERBIA FOR EXCELL
692276	FOODstars
692331	NitroPortugal
692413	EDGE
727217	ReMIX
727495	CORE Organic Cofund
727520	SURE-Farm
727577	AgriLink
739570	ANTARES
739574	InnoRenew CoE
739582	PlantaSYST
772705	NEFERTITI
773418	LIAISON
809943	GeoTwinn
810630	VALORTECH
810775	DRAGON
810812	FASTER
810980	ENeRAG
817690	CropBooster-P
817903	EFFECT
817949	CONSOLE
818182	SmartAgriHubs
818187	STARGATE

Proposal Number	Acronym
856612	EMME-CARE
857510	EXCELSIOR
862357	MIXED
862665	ICT-AGRI-FOOD
862695	EJP SOIL
862756	OPTAIN
862790	Eureka
952051	SOILdarity
952111	EOTiST
952303	AgriFoodBoost
952314	ASFORCLIC
952327	HES-GEO
952330	STARGATE
952384	EXtremeClimTwin
952396	SMARTWATER
952594	DRIFT-FOOD
952600	TrustEat
952601	WELCOME2
101000256	WeLASER
101000349	ALL-Ready
101000375	BRANCHES
CA18207	BOTTOMS-UP
CA18237	Eudaphobase
CA19110	PIAgri