Towards climate-smart sustainable management of agricultural soils

Deliverable: D3.4

Call text of the EJP SOIL 2nd Internal Call

Due date of deliverable: M16
Actual submission date: 01.04.2021

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

GENERAL DATA

Grant Agreement: 862695
Project acronym: EJP SOIL
Project title: Towards climate-smart sustainable management of agricultural soils
Project website: www.ejpsoil.eu

Start date of the project: February 1st, 2020
Project duration: 60 months
Name of lead contractor: INRAE

Funding source: H2020-SFS-2018-2020 / H2020-SFS-2019-1
Type of action: European Joint Project COFUND

DELIVERABLE NUMBER:	D3.4
DELIVERABLE TITLE:	Call text of the EJP SOIL 2nd Internal Call
DELIVERABLE TYPE:	Report
WORK PACKAGE N:	WP3
WORK PACKAGE TITLE:	Internal calls
DELIVERABLE LEADER:	Nils Borchard
AUTHOR:	Rosemarie Stangl, Pia Minixhofer, Elena Rodríguez-Valín, Violeta Carrasco, Eeva Karjalainen
DISSEMINATION LEVEL:	PU

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Content

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Timeline

The Internal Call will follow a 1-step-procedure. There will be a competitive selection. A time schedule is provided below:

Action	Project calendar	Schedule
Call pre-announcement	M14	1 March 2021
1st Webinar for interested applicants	M14	12 March 2021
Launch of the call	M15	1 April 2021
2nd Webinar for interested applicants	M15	9 April 2021
Closing date for proposal submission	M16	31 May 2021
Proposal evaluation and selection	M17-20	June - September 2021
Notification letters sent to project coordinators	M21	October 2021
Grant preparation	M21	October 2021
Start of research projects	M22	November 2021
End of research projects	-/-	Depends on project size

Partnering tool

For partnering the EJP SOIL WP3 team launched **Slack Channels** (i.e. topic-specific chat rooms at www.slack.com). Access will be granted after sending an e-mail to the Call Office (EJPCO@maapera.fi). After access has been granted, applicants express their interest to participate and/or coordinate in one or more topic-specific Slack Channels (i.e. a type of chat room). For each topic listed in Table 1 and Annex 2 the partnering tool offers a "chat room" (i.e. "CM1", "DATA1") and an embedded XLS file used to summarize the information: Who am I? Where do I work? What is my expertise? What is my interest => participation/coordination? Finally, applicants should add their name and interest to participate and/or coordinate into the XLS file.

Call Office contacts

NAME:	**Nils Borchard**	**Eeva Karjalainen**
Organisation:	Luke	Luke
Phone:	+358 29 5322 201	+358 29 5322 146
E-mail:	EJPCO@maapera.fi	EJPCO@maapera.fi
NAME:	**Rosemarie Stangl**	**Pia Minixhofer**
Organisation:	BIOS/BOKU	BIOS/BOKU
Phone:	+43 1 47854 87401	+43 1 47854 87406
E-mail:	EJPCO@maapera.fi	EJPCO@maapera.fi

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

1 Background of the Call

1.1 About the EJP SOIL

The EJP SOIL will maximize the understanding contribution of agricultural soil towards achieving sustainability at multiple levels: **i) At the societal level**: raise public awareness and foster understanding of sustainable agricultural soil management and its contribution to food production, climate change adaptation and mitigation; **ii) At the scientific level**: develop new insights on climate-smart soil management, quantify trade-offs and synergies between agricultural production, climate change adaptation and mitigation, maintenance of soil fertility and health and other ecosystem services; gather new knowledge on carbon sequestration in soils under different conditions across Europe and its contribution to climate change mitigation; improve accounting and reporting tools for emission and removals from agricultural activities; **iii) At the operational level**: strengthen the European research community on agricultural soil management; develop harmonized soil information systems and promote their adoption; **iv) At the policy level**: develop evidence-based recommendations for policy makers at EU, national, and regional levels; establish a strategic multi-actor approach and initiate a science-policy-practitioner-society dialogue on agricultural soil health and sustainable agricultural practices to support the adoption of the policy recommendations; foster the uptake of climate-smart sustainable soil management practices by practitioners.

1.2 Rationale of this call

As EJP SOIL works on important societal issues in an integrated manner, any innovation developed within the framework of EJP SOIL will meet a societal need and will therefore be relevant for European and global markets. Through its knowledge framework the EJP SOIL supports **knowledge development** through a large number of specific research and innovation projects *via* internal (i.e. WP3 “Internal Calls”) and external EJP SOIL calls. The **overall objective of this 2nd internal call** is to fund research projects open to EJP SOIL beneficiaries and linked third parties to fill research and development gaps identified by the “Roadmap for the European Joint Program SOIL”[1] and the annual work program of the EJP SOIL for year two.

1.3 Scope and expected impacts and outputs of EJP SOIL

The EJP SOIL contributes to long-term alignment of research strategies in two main ways: **i)** by developing a shared vision, and **ii)** by establishing platforms for networks of soil scientists and other soil stakeholders in Europe. The shared vision will be developed among consortium beneficiaries and will address desirable soil properties and ways to attain them. This process was initiated during the preparation of the proposal and continues with the update of a roadmap for soil research, setting objectives, actions and milestones in the annual programs. Internal calls will foster alignment between the EJP SOIL beneficiaries, linked third parties and important players of European research in the areas of agricultural sciences, ecology, soil and

[1] Keesstra et al. 2020. Roadmap for the European Joint Program SOIL: Towards climate-smart sustainable management of agricultural soils (Deliverable 2.4)

These projects have received funding from the European Union’s Horizon 2020 research and Innovation programme under grant agreement No. 862695.

climate sciences. To facilitate relevant knowledge development the EJP SOIL will perform **research projects:**

Research projects will answer a research question or a set of research questions. A Research Project must include a description of a defined protocol, clearly articulated goal(s), defined methods and outputs, and a defined start and end date.

Evaluated and selected research projects of 2nd internal EJP SOIL call will get funded after validation by the Board of Project Managers; for more details see section 2 of this document.

2 Call topics

Project consortia should apply to one of the following EJP SOIL topics:

Table 1: Targeted EJP SOIL topics of the 2nd internal call; project size, number of projects that can be granted and available funding are also provided. For detailed description see Annex 2 of this document. Project size is explained in detail in section 4.3.

EJP SOIL topic ID†	Title	Number of projects, their size	Indicative available funding per project
CM1	Plant below-ground inputs to enhance soil carbon sequestration in agricultural soils	1, medium	2M€
CM5	Effects of the soil biome on the persistence SOC storage and its drivers	1, medium	2M€
CA4/SP3	Contribution of soils to climate mitigation and adaptation, sustainable agricultural production and environment in agroecological systems	1, large	5M€
SP1	Alleviating soil compaction in a climate change context.	1, medium	2M€
SP2	The use, processing and application of external sources of organic matter to mitigate climate change and improve soil health	1, medium	2M€
DATA1	Innovative techniques to monitor SOC stocks and soil degradation/restoration changes in the EU, using spectral systems/NIRS/MIRS, and other proximal sensing tools.	1, medium	2M€

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

EJP SOIL topic ID†	Title	Number of projects, their size	Indicative available funding per project
SE2/ INDICATORS 1	Modelling soil functions and soil threats for mapping soil quality, soil functioning and ecosystem services.	1, large	5M€
SE4/ INDICATORS 2	European soil biodiversity forecast towards resilient agroecosystems in response to climate change	1, medium	2M€
POL2/ES7	Enabling conditions for climate smart and sustainable soil policy: fair and functional incentives for ecosystem services related to climate mitigation and sustainable production	1, medium	2M€

† EJP SOIL topic ID: CM Climate change mitigation; CA Climate change adaptation; SP Sustainable production; NET Networking and knowledge sharing; SE Sustainable environment ; DATA Harmonizing soil information; AD Adoption of sustainable soil management; POL Science policy interface.

3 Budget, funding modalities, eligibility criteria and project types

The EJP SOIL is a 5-year program that runs from February 2020 (M01) to January 2025 (M60). The EJP SOIL falls into the concept of a co-fund action. **For the 2nd internal call of EJP SOIL projects a budget of maximum 30 M€ has been allocated**. General information relevant for consortium building (e.g. project size, number of consortium beneficiaries and linked third parties; geographical coverage) is given in Table 1 and in detail in Annex 2 for each topic.

After the closing date for submission, all proposals will be checked against the mandatory call`s eligibility criteria:

- The application must be written in English.
- Applications must be complete and in accordance to the submission procedure.
- Applications must be submitted in time.
- Proposals including beneficiaries and/or third linked parties that are NOT EJP SOIL beneficiaries are not eligible to apply and will be rejected (see Annex 1).

EJP SOIL experts who are involved in the internal call preparation (i.e. Nils Borchard, Rosemarie Stangl, Pia Minixhofer, Elena Rodríguez-Valín, Violeta Carrasco, Markus Lier, Eeva Karjalainen, Pierre Benoit) cannot participate in the preparation of proposals nor get involved in subsequent project implementation.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Depending on the topic and type of project, the proposal must meet the following specific call eligibility criteria:

- **Medium sized project**: minimum 5 consortium beneficiaries and/or linked third parties with geographical coverage requested in the topics of this call; inclusiveness is of high importance; duration between 12 and 36 months; up to 2 M€.
- **Large sized project**: minimum 10 consortium beneficiaries and/or linked third partiess with geographical coverage requested in the topics of this call; inclusiveness is of high importance; duration of up to 36 month; up to 5 M€.

4 Submission, eligibility check, evaluation and selection

On the 12th March 2021 (M14) and 9th April 2021 (M15) webinars for interested applicants will be organised, which will give an overview about all relevant aspects of the Call (i.e., topics, conditions, requirements, proposal submission, evaluation, etc.) and provide time to answer open questions. More detailed information will be released directly on the submission tool website (Link) in due time.

4.1 Submission

Please follow the instructions on of the call text published at www.ejpsoil.org to submit the proposal (font: Arial, font size: 12, line space: 1.5) prepared in accordance to detailed instructions given in Annexes 3 to 5:

- Annex 3: Proposal template: Project information; Consortium beneficiaries and linked third parties; Project summary budget; Description of the work; Communication strategy; Data management strategy; work packages and work plan
- Annex 4: Budget plan;
- Annex 5: Ethics => Self-assessment;
- Annex 6: Certificate of co-funding => to be submitted after selection;
- Annex 7: Letter of confirmation => signed by the project coordinator and submitted after selection.

Annexes 4 should be submitted in form of a XLS file while the main application (based on annexes 3 and 5) should be submitted in form of a PDF file (i.e.; in max. 5 MB) to the Call Office by the project coordinator on behalf of the project consortium via the EJPSOIL online proposal submission system (Link).

4.2 Expert evaluation of proposals

The evaluation of eligible proposals will be performed by a peer-review expert panel. This panel is composed of international experts with acknowledged scientific excellence and high expertise of the respective discipline. The members of the panel are proposed and selected by the Call Board considering the research areas covered by the submitted proposals. Appointed experts will need to strictly respect the Call Boards' standards and rules for impartiality and confidentiality.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Each proposal will be evaluated by at least three independent experts against the following criteria[2]:

Excellence
Relevant for large and medium research projects (see section 2 and Annex 2):
- Clarity, pertinence, and scientific quality of objectives, ambition in relation to the call scope and topic addressed and innovative progress beyond the state-of-the-art;
- Appropriate consideration of interdisciplinary approaches and, where relevant, use of stakeholder knowledge in research and innovation content;
- Soundness of the concept, and credibility of the proposed methodology;

Relevant for large sized projects (see section 2 and Annex 2):
- Level of ambition in the collaboration and commitment of the participants in the proposed large sized projects to pool national resources in terms of number of consortium beneficiaries and/or linked third partiess and participating countries.

Impact
Relevant for all project types listed in table 1 (see section 2 of this document and Annex 2):
- The extent to which the outputs of the project would contribute to each of the outcomes and expected impacts mentioned in the topic-specific call text, see Annex 2;
- Quality of the proposed measures to exploit and disseminate the project results (including management of Intellectual Property Rights (IPR), to manage research data where relevant, and to communicate the project activities to different target audiences (see detailed instructions in section 7 under “Communication and dissemination”)

Relevant for large and medium sized research projects (see section 2 of this document and Annex 2):
- Any substantial impacts not mentioned in the topic-specific call text (Annex 2) that would enhance innovation capacity, address issues related to sustainable and climate-smart soil management, or bring other important benefits for society;
- Contribution to establishing and strengthening a durable cooperation between the consortium beneficiaries and/or linked third partiess;

Implementation
Relevant for all project types listed in Table 1 (see section 2 of this document and Annex 2):
- Complementarity of the participants and extent to which the consortium as a whole brings together the necessary expertise;
- Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.

Relevant for large and medium sized research projects (see Annex 2):
- Quality and effectiveness of the work plan, including extent to which the resources

[2] Evaluation rules of the Horizon 2020 (https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-h-esacrit_en.pdf)

These projects have received funding from the European Union’s Horizon 2020 research and Innovation programme under grant agreement No. 862695.

assigned to work packages are in line with their objectives and deliverables;
- Appropriateness of the management structures and procedures, including risk and innovation management;

The three criteria will be scored independently, using scores from 0-5 for each criterion[3]. A threshold of 3/5 will be applied for each criterion, i.e. proposals with a mean score < 3 in any main criterion and their sum (Σ of Excellence, Impact, Implementation) ≤ 9.99 will not be recommended for funding. The evaluation by the peer-review expert panel will result in a ranking list per topic. The experts will provide a written evaluation report on strengths and weaknesses of each proposal. The evaluation reports will be communicated to the applicants as part of the notification letter. It is emphasized that due to the nature of this Call, the evaluation of proposals will be assessed under the premises of creating added value for EJP SOIL. This means that special attention should be paid to the scope of the Call described in section 1.2.

In addition to the above mentioned criteria, also the Ethical issues (see under section 7) will be checked by the experts using the information provided by the applicants. Additional ethical assessment on the national level can be performed by the funding bodies on optional basis.

4.3 Proposal selection

The Board of Program Managers (BPM; section 8 “Definitions”) will validate the research proposals for funding based on the expert panel evaluation results (Section 4.2) and recommendation for funding provided by the coordinator of the EJP SOIL (i.e. Coordination (evaluation report) in consultation with the ExCom (based on ranked list).

The criteria for selection are based on overall scores given by the evaluation results (see section 4.2 of this document). Selection does not include weighting of criteria.

In case of equal overall scoring (section 2.2) for proposals applying for the same topic the BPM will evaluate against “relevance” criteria (see below): Contribution to better alignment of European and national activities and policies. If a proposal fails at this stage the reasons will be explained in detail in the decision letter and report.

The “Relevance” criteria will be scored independently; using scores from 0-5 for each criterion (see section 4.2 of this document).

[3] **0: Failure**: The proposal fails to address the criterion in question, or cannot be judged because of missing or incomplete information; **1: Poor**: The proposal shows serious weaknesses in relation to the criterion in question; **2: Fair**: The proposal generally addresses the criterion, but there are significant weaknesses that need corrections; **3: Good**: The proposal addresses the criterion in question well but certain improvements are necessary; **4: Very good**: The proposal addresses the criterion very well, but small improvements are possible**; 5: Excellent**: The proposal successfully addresses all aspects of the criterion in question.

These projects have received funding from the European Union’s Horizon 2020 research and Innovation programme under grant agreement No. 862695.

The outcome of the BPM validation procedure will be communicated by the Call Office to the research project coordinators, who are responsible for informing their project beneficiaries and/or linked third parties about the result.

In some instances, the BPM might formulate conditions for research project (mandatory) or recommendations (optional) based on expert evaluation and BPM discussion to improve certain aspects of the applications.

4.6. Formal commitment of the participating organisations

As selected research projects are 44% EU funded, each participating organisation of each selected project must fill in Annex 6 certificate of co-financing, in order to ensure that expected amounts to be co-funded will be made available in course of implementation of the project. Hence, after formal validation for funding, all involved beneficiaries/linked third parties have to sign a Certificate of co-financing (see Annex 6). This certificate aims at ensuring that each participating institute accepts to engage the necessary co-financing in order to implement the project. All this information should be collected by the project coordinator and sent completely and in time to the Call Office (see also sections “Timeline”, “4.1 Submission” and “7. Obligations for funded proposals”).,

5 Ethics assessment

An Ethics assessment is required for submission of proposals addressing the following ethical issues: environment, health and safety, exclusive focus on civil applications, personal data and data protection, misuse of research results and other ethics issues. Work involving the use of animals or humans should be carried out under the appropriate authorization, taking into account the European Union and national ethical requirements. Any proposal which seems to contravene fundamental ethical principles, shall not be selected, and may be excluded from the evaluation and selection procedure. Judgement of the significance of ethical issues will be made by using the criteria published by the Commission in its guidelines for the Horizon 2020 Framework Programme.

The applicant is required to complete the ethics self-assessment (Annex 5) and provide a supporting documentation referred to in the ethics issues checklist. The **ethics self-assessment** (Annex 5) becomes part of proposal preparation and may thus give rise to binding obligations that may later on be checked through ethics checks, reviews or audits. This means the time invested in this self-assessment is not wasted. It will actually improve research results and:

- the proposed research will be in line with applicable international, EU and national law;
- the proposal will be processed more easily during the EJP SOIL proposal selection procedure;
- the results of the research can be published more easily in internationally refereed journals;

These projects have received funding from the European Union’s Horizon 2020 research and Innovation programme under grant agreement No. 862695.

- applicants will contribute to the responsible conduct of research, thereby increasing its social acceptance.

Ethics also matter for scholarly publication. Major scientific journals in many areas will increasingly require ethics committee approval before publishing research articles.

First source should always be at the applicant`s institution. We would ask each applicant to seek advice from colleagues with expertise in the ethics of research, such as:

- specialized ethics departments;
- relevant managers in the applicant`s university/research organization;
- ethics advisers in the applicant`s organization;
- data protection officers.

They will provide information appropriate to the proposed project`s specific needs and legal environment. Consider involving/appointing an ethics adviser/Data Protection Officer. From the beginning of the project, an ethics adviser can assist with ethical issues and put in place the procedures to handle them appropriately.

Please consult Horizon 2020 Programme Guidance "How to complete your ethics self-assessment"[4]. In addition, applicants can consult on the EC Website the Guidance Note – Ethics and Food-Related Research on core issues of ethical concern in the field of food-related research including appendix that addresses broader concerns in the field of food ethics.

6 Confidentiality and Conflict of interest

The proposals will be handled confidentially by the Call Office and the mandated experts responsible for the peer-review evaluation of the proposals. Each expert will have to sign a Declaration of Conflict of Interest, Confidentiality Disclosure Agreement and Code of Conduct Agreement.

7 Obligations for project coordinators and funded projects

Each research project needs to appoint a project coordinator. The project coordinator has the following role and responsibilities (see section 7):

- Confirm co-funding commitment (see Annex 6) of all involved EJP SOIL beneficiaries and linked third parties to ensure the eligibility of the project,
- Lead the consortium throughout the application procedure and be responsible for the correct submission of the full proposal (i.e. single step approach; see also section 5),

[4] https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/ethics/h2020_hi_ethics-self-assess_en.pdf

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

- Be responsible for the overall project coordination and act as the central contact point for the consortium during the full lifespan of the project,
- Inform the Call Office about any event that might affect the implementation of the project,
- Ensure that all work is carried to a high standard and that it meets contractually bound deliverables and milestones presented in the full proposal and approved by the funding bodies,
- Be responsible for the sharing of information, data and results among EJP SOIL beneficiaries and linked third parties,
- Ensure timely and complete delivery of milestones, deliverables, and financial reports as described in the approved work program, as well as reporting and monitoring obligations to WP3 team and EJP SOIL Coordination. The project coordinator will not be responsible for the financial management of project funding, which will be handled directly by the involved consortium beneficiaries and linked third parties.

Terms of participation

The project coordinators of the research consortia are requested to acknowledge the overall coordinating role of EJP SOIL throughout the duration of the funded research projects until the delivery and acceptance of the final project report by signing a letter of commitment (Annex 7).

Start date of projects

A project can start after the BPM validates the proposal (i.e. Funding Decision) and letters of commitment have been signed by project coordinators. Once the EJP SOIL Funding Decisions comes into force and grant preparation is completed, eligible costs may be claimed according to the European and national procedures. Projects should start in November 2021 (M22).

A list of the funded projects will be published in October 2021 (M21; and submitted to the European Commission as a deliverable [D3.5]). Therefore, applicants should be aware that the following information from the proposals may be published by EJP SOIL:

- Project title and project acronym,
- Duration of the project,
- Total funding of the project,
- Name of the project coordinator (including contact information as email and telephone number),
- Country and organisation name of each beneficiary/linked third parties,
- The publishable summary of the project from the application.

Information on each funded research project, including data on each participant and overview on the results will be sent to the European Commission after the end of the project period.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

With the submission of the proposal all consortium beneficiaries and/or linked third parties agree that the above-mentioned information can be published. All personal data offered for project applications, reviewers and expert assessments, mailing lists, tracking websites, registration for activities and events will be collected, stored and processed in accordance with the General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679). A data protection officer (DPO) of each involved beneficiary will be consulted, if necessary, to ensure compliance GDPR rules in collaboration with WP1, which manages data protection at EJP SOIL level. All the applicants are also expected to follow data protection and data sharing provisions of the EJP SOIL Consortium Agreement and EJP SOIL POPD. For more information please consult the privacy policy on the submission website or the Call Office.

National/ regional contracts

The project coordinators of internally funded EJP SOIL projects are responsible for informing consortium beneficiaries and/or linked third parties about the selection result, for the implementation of possible conditions and recommendations of expert panel and BPM and for synchronising the project start among the consortium beneficiaries and/or linked third parties. After the project has been selected, the project coordinators will be contacted by the EJP SOIL Call Office in order to start the grant negotiation and accomplish the remaining steps until the research project can start.

Financial issues and changes to the work plan or consortium

For the whole duration of the research project contract, it is the responsibility of the project coordinator to inform the Call Office about any changes in his project, i.e. modifications within the work plan, project consortium or contract. The changes will need to be approved by the respective beneficiaries/linked third parties (i.e. legal signatory who have the authority to sign Annex 6).

Project monitoring, meetings and reporting

Each funded research project is expected to organise project meetings on a regular basis. The costs for these meetings should be included in the project budget. To enhance dissemination of the project results, additionally or in parallel to the own project meetings, all coordinators of internally funded medium and large EJP SOIL projects should calculate costs for the attendance of three mandatory consortium meetings (kick-off-, mid-term- and final meeting) in their project plan.

In order to promote coherence, project coordinators will be required to submit annual work plans for their projects that will be included in the EJP SOIL annual program as well as summary progress reports, annual technical reports, and a final technical report to the monitoring team (or WP3 team) and EJP SOIL Coordination (WP1 team) about the results of their transnational project as a whole (in addition to reporting required at national level). Detailed information on the reporting and monitoring procedures as well as templates will be provided to the coordinators of the proposals selected for funding in due course.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Communication and dissemination

Communication[5], dissemination[6] and exploitation[7] of outputs is a key part of the work done in the EJP SOIL. At the level of EJP SOIL funded project responsibilities are shared between internally funded EJP SOIL research projects, and WPs of the EJP SOIL. The project applicants are asked to read and refer to EJP SOIL's definition of *Communication, Dissemination* and *Exploitation*, when including considered specifications and budget lines for project communication, dissemination and exploitation activities. **Thus, the communication and dissemination plan is considered in the evaluation procedure of large, medium and small sized projects**; see Annex 3. WP9 (Claus Bo Andreasen, clausbo.andreasen@dca.au.dk and Line Carlenius Berggreen, lcb@dca.au.dk) of the EJP SOIL supports communication and dissemination *via* a two-stage approach:

- **Stage 1** (during proposal preparation): Describe in the proposal the relevance of proposed research for specific stakeholders, and how the project will engage and interact with these on both national and European level (Annex 3). An EJP SOIL communication and dissemination kit is accessible at www.ejpsoil.com (see for more details below => Stage 2).
- **Stage 2** (during project implementation): WP9 (Claus Bo Andreasen, clausbo.andreasen@dca.au.dk and Line Carlenius Berggreen, lcb@dca.au.dk) will support the funded EJP SOIL projects **with tools and structures** for communication and dissemination of activities and relevant results; including:
  - Project subpages at www.ejpsoil.org, making it possible to publish project results etc.;
  - An EJP SOIL newsletter providing stakeholders with information on research results, events etc.;
  - A communication and dissemination kit providing logos, templates etc.;
  - Access to a network of National Communication Representatives (NCRs)[8] committed to support interaction with national stakeholders;
  - A quick guide assisting project members in successful communication;
  - EJP SOIL workshops to be held in all participating countries engaging national key stakeholders;
  - Annual science days allowing EJP SOIL consortium beneficiaries and/or linked third partiess to meet and present their work;

The consortium beneficiaries and/or linked third parties have to acknowledge the transnational funding of the EJP SOIL co-funds and the individual national

[5] Communication is the act of keeping an ongoing dialogue and information flow with and towards our external stakeholders. Keeping them engaged, updated and in the loop of what is going on in the EJP SOIL programme.

[6] Dissemination is spreading the news. It is the circulation of news and outcomes. Spreading and diffusing information about progress, outcomes and results from the EJP SOIL programme, reaching far into all relevant stakeholder networks. Making stakeholders EJP SOIL ambassadors.

[7] Exploitation is, based on the above, fostering actual application, utilization, and employment of EJP SOIL outcomes.

[8] The Project Communication Representatives (PCRs) is responsible for all project related communication and dissemination activities. Funded projects must specify how they will draw upon relevant professional assistance from WP9 and NCRs together with institutional communication departments to secure stakeholder and end user engagement at national level.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

institutes/organizations in any document that is published (in written, oral or electronic form) within the research project.

The EJP SOIL supports the European Commission´s recommendation to make research results from public-funds accessible and thereby strengthening the knowledge base for science and the society alike. For more information please refer to the rules in H2020 projects and the EJP SOIL`s Consortium Agreement. Publications need to be published in Gold or Green Open Access and both publications and research data need to be deposited in Open Access repositories.

Intellectual property rights, use and access to results

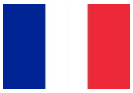
Results and new Intellectual Property Rights (IPR) arising from projects funded through the EJP SOIL Internal Call will be owned by the consortium beneficiaries and/or linked third parties according to the conditions stated in the EJP SOIL Grant Agreement and Consortium Agreement and shall not be in conflict with the respective national regulations. Applicants should consult the respective national institutes/organizations, if any questions arise. Researchers are encouraged to actively exploit the results of the project and make them available for use, whether for commercial gain or not, for public benefit to be obtained from the knowledge created.

8 Definitions

Board of Program Managers (BPM): Decision making body of the EJP SOIL consisting of the Program Managers representatives.
Call Office: responsible for administrative support regarding the Call, Call documents and procedures, submission tool and webinar.
Beneficiary/linked third parties: Legal entity eligible to apply for and receive internal EJP SOIL funding. Beneficiaries of the EJPSOIL and their linked third parties listed in the Grant Agreement under Art 14.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Annex 1. EJP SOIL beneficiaries and their linked third parties

Member states	EJP SOIL beneficiaries and their linked third parties	Contact (Name and e-mail)
	Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement - INRAE Linked third parties: AgroParisTech, AgroCampus Ouest, SupAgro Montpellier	Chantal Gascuel chantal.gascuel@inrae.fr
	Stichting Wageningen Research – WR	Saskia Visser saskia.visser@wur.nl
	Verein zur Förderung der Lebenswissenschaften - BIOS Linked third parties: BOKU, AGES, BAW, BFW, Environmental Agency Austria	Sophie Zechmeister-Boltenstern sophie.zechmeister@boku.ac.at
	Flanders Research Institute for Agriculture, Fisheries and Food - EV-ILVO Linked third parties: EV INBO, VPO	Greet Ruysschaert Greet.ruysschaert@ilvo.vlaanderen.be
	Centre Wallon de Recherches Agronomiques – CRAW	Bruno Huyghebaert b.huyghebaert@cra.wallonie.be
	Czech University of Life Sciences – CZU	Luboš Borůvka boruvka@af.czu.cz
	Aarhus University, Danish Centre for Food and Agriculture – AU	Lars Juhl Munkholm lars.munkholm@agro.au.dk
	Estonian University of Life Sciences – EMU Linked third party: ARC	Alar Astover alar.astover@emu.ee
	Luonnonvarakeskus - Natural Resources Institute Finland – LUKE	Nils Borchard Nils nils.borchard@luke.fi
	Johann Heinrich von Thünen-Institut – Thunen	Axel Don axel.don@thuenen.de
	Forschungszentrum Jülich GmbH – Julich	N/A
	Agricultural Research Centre Agrártudományi Kutatóközpont - MTA ATK	Zsofia Bakacsi bakacsi.zsofia@agrar.mta.hu
	Teagasc – The Agriculture and Food Development Authority - Teagasc	David Wall david.wall@teagasc.ie

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Member states	EJP SOIL beneficiaries and their linked third parties	Contact (Name and e-mail)
	Council for Agricultural Research and Economics - CREA Linked third parties: CNR, ISPRA, UNIPA, ENEA, AGRIS, ERSAF Lombardia	Rosario Napoli rosario.napoli@crea.gov.it
	University of Latvia – UL	Raimonds Kasparinskis raimonds.kasparinskis@lu.lv
	Lithuanian Research Centre for Agriculture and Forestry – LAMMC	Žydrė Kadžiulienė zydre.kadziuliene@lammc.lt
	Norwegian Institute of Bioeconomy Research – NIBIO	Daniel Rasse daniel.rasse@nibio.no
	Institute of Soil Science and Plant Cultivation – State Research Institute – IUNG	Bożena Smerczak bozenas@iung.pulawy.pl
	National Institute for Agrarian and Veterinarian Research I. P. (INIAV)	Maria da Conceição Gonçalves maria.goncalves@iniav.pt
	National Agricultural and Food Centre – NPPC	Dana Peškovičová dana.peskovicova@npppc.sk
	University of Ljubljana - UL Linked third parties: AIS, UM-FKBV	Helena Grčman Helena.Grcman@bf.uni-lj.si
	National Institute for Agriculture and Food Research and Technology (INIA) Linked third party: CSIC	Elena Rodríguez-Valín rodriguez.elena@inia.es
	Swedish University of Agricultural Sciences – SLU	Anke Herrmann anke.herrmann@slu.se
	Agroscope- AGS	Gina Garland gina.garland@agroscope.admin.ch
	Ministry of Agriculture and Forestry, General Directorate of Agricultural Research and Policies – TAGEM	Sevinç Madenoglu sevinc.madenoglu@tarimorman.gov.tr
	Agri-Food and Biosciences Institute - AFBI	Dario Fornara Dario.fornara@afbini.gov.uk

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Annex 2. EJP SOIL call topics

Topic: Climate change Mitigation (CM)

CM1 - Plant below-ground inputs to enhance soil carbon sequestration in agricultural soils

Rationale/Specific challenge: Soil organic carbon sequestration qualifies as a significant GHG removal technology, at low cost compared to other negative emission technologies (IPCC 2019). The Green Deal increased Europe's ambitions regarding climate change mitigation with an objective of zero net GHG emissions by 2050 (European Commission, 2019)[9]. There will be the need to use the full potential of European soils for mitigation and adaptation strategies, in particular by increasing the soil organic carbon pool in agricultural soils by implementing sustainable soil management practices (Montanarella and Panagos, 2021)[10]. Agricultural soils have indeed a key role as they have lost huge amounts of soil organic C since the advent of agriculture (Sanderman et al. 2017)[11], and have thereby a large potential to store additional carbon and sequester CO2 from the atmosphere, through appropriate soil and crop management options (e.g. Smith et al. 2008)[12]. There is an increasing agreement that crop root systems are major determinants of increasing topsoil and subsoil SOC stocks. Increasing below ground C inputs to soil may be achieved by a variety of management options, from the selection of varieties of annual crops with deep rooting and large allocation to their belowground parts, to the implementation of cover crops, of multispecies cropping systems, of high diversity grasslands, or of silvo-arable or silvo-grassland agroforestry systems. The present knowledge does not allow, however, to predict root derived SOC storage nor its persistence in agricultural soils as related to root traits or functions, or to soil and climate characteristics in the different soil cover and management systems.

Scope: The project will aim to assess the contribution of belowground parts of plants to soil C and its persistence for a diversity of agricultural systems and management practices. Proposing relevant descriptors/root traits (e.g. root biomass, root architecture, rhizodeposition) is necessary to predict the effect of root systems on SOC stocks. Both experimental and modelling efforts are required to make progress in the understanding of the effects of the diversity of systems (e.g. intercrops, cover crops, diverse grassland plants, agroforestry) on C allocation to belowground parts of plants (shallow or deep roots, mycorrhizas and rhizomes) and their residues and rhizodeposits, as well as their control by soil type and climate. Combining syntheses and meta-analyses of field experiments with modeling approaches will be particularly useful to assess the C sequestration potential of the different rooting systems. The project should contribute to the root/shoot database for C-input data to the soil

[9] European Commission, 2019. The European Green Deal. =COM (2019) 640 final

[10] Montanarella, L., Panagos, P., 2021. The relevance of sustainable soil management within the European Green Deal. Land Use Policy 100.

[11] Sanderman, J., Hengl, T., Fiske, G.J., 2017. Soil carbon debt of 12,000 years of human land use. Proc Natl Acad Sci U S A 114(36), 9575-9580.

[12] Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H., Kumar, P., McCarl, B., Ogle, S., O'Mara, F., Rice, C., Scholes, B., Sirotenko, O., Howden, M., McAllister, T., Pan, G., Romanenkov, V., Schneider, U., Towprayoon, S., Wattenbach, M., Smith, J., 2008. Greenhouse gas mitigation in agriculture. Phil. Trans. R. Soc. B 363, 789-813.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

developed by the EJP SOIL CarboSeq project, and, to identify the co-benefits of deep rooting systems. The latter should consider adaptation to drought events and climate change, reduction of N leaching, promotion of habitats for soil biota, protection from erosion and evaluation of trade-offs with yield maintenance and potential additional GHG emissions.

Expected outcomes:

- Sound scientific evaluation of the C sequestration potential, co-benefits and trade-offs of selected management options and agricultural systems (e.g., annual crops or perennial systems) resulting in increased and deeper OC belowground inputs.
- Improved knowledge on root traits for annual and perennial plants usable by plant breeders.

Expected impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI2: Understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

CM5 - Effects of the soil biome on the persistence SOC storage and its drivers

Rationale/Specific challenge: Agricultural soils are currently facing a decrease in soil biodiversity (abundance and diversity of soil biota) as a consequence of intensification, simplification of crop rotations or monocropping, mechanization and excess use of pesticides and fertilizers (FAO, ITPS, GSBI, SCBD and EC, 2020). Preserving and restoring soil biodiversity is now recognized as a major challenge at the EU level (Veerman et al. 2020)[13]. The EU Biodiversity Strategy expresses the ambition of the EU to reverse biodiversity loss (European Commission, 2020)[14] and its targets with that of the Farm do Fork Strategy (European Commission, 2020)[15] of reducing the use of pesticides by 50% in 2030, achieving 25% of total farmland under organic farming by 2030 and at least 10% agricultural land under landscape features with high biodiversity, should have a positive effect on soil biodiversity. Farming practices and agricultural systems have a major effect on the soil biome (fauna and microbial communities) and its functioning (e.g. carbon use efficiency). Yet, the extent to which soil biome controls SOC sequestration and whether this can be managed is not sufficiently known. Such knowledge is needed for recommendations of management options that preserve or increase soil organic carbon stocks. For instance, in organic agriculture, as yields are generally lower, organic inputs are consequently smaller, but SOC stocks can be maintained or even increased which is ascribed to changes in the carbon use efficiency of soil microorganisms. The importance of stoichiometry, especially carbon/nitrogen/phosphorus ratios, in controlling carbon use efficiency by soil organisms and its consequences on the balance between SOC storage and GHG emissions also warrants further research.

Scope: The project will aim to study the relationships between soil carbon cycling and the diversity of the soil microbiome and fauna. An important question is the effect of soil management practices, especially through the stoichiometry of organic matter inputs (crop residues, organic amendments, below ground inputs from plants) on the carbon use efficiency of soil microorganisms and, ultimately, on SOC sequestration. The effects of soil biome on SOC sequestration should be investigated in real case-studies (on-farm and/or experimental field sites) representing a diversity of soil management and pedo-climatic conditions. A special focus should be placed on the identification of the drivers related to soil status and management, which may favor or hamper the adequate functioning of soil microbial communities regulating SOC sequestration. The measures and agricultural systems included in the Green Deal targets could be considered. Improving existing biogeochemical SOM models by incorporating new knowledge on the effects of soil biome on carbon and nitrogen cycles should also be investigated in order to evaluate the trade-offs between SOC storage and GHG emissions.

[13] Veerman, C., Correia, T.P., Bastioli, C., Biro, B., Bouma, J., Cienciala, E., Emmett, B., Frison, E.A., Grand, A., Filchew, L.H., Kriaučiūnienė, Z., Pogrzeba, M., Soussana, J.-F., Olmo, C.V., Wittkowski., R., 2020. Caring for soil is caring for life – Ensure 75% of soils are healthy by 2030 for food, people, nature and climate. Report of the Mission Board for Soil health and food. ISBN 978-92-76-21602-5 European Commission Directorate-General for Research and Innovation and Directorate-General for Agriculture and Rural Development Directorate B — Quality, Research & Innovation, Outreach Unit B2 —Research and Innovation, Brussels.

[14] Commission, E., 2020. Biodiversity Strategy for 2030 Bringing nature back into our lives. COM/2020/380 final

[15] European Commission (2020). A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system. COM/2020/381 final

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Expected outcomes:

- Identifying drivers related to soil management effects on soil biome which may enhance/prevent SOC sequestration and other co-benefits in different EU pedo-environmental zones.
- Qualifying farming systems promoting soil biodiversity in terms of their potential for mitigating climate change (increased SOC sequestration, decreased GHG emissions).

Expected impacts:

- EJP SOIL EI2: Understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Topic: Climate change Adaptation (CA)

CA4/SP3 Contribution of soils to climate mitigation and adaptation, sustainable agricultural production and environment in agro-ecological systems

Rationale/Specific challenge: Agro-ecological systems are characterized by higher biodiversity at all levels (intra- and interspecies, cropping and farming systems, landscapes and non-agricultural elements) than traditional highly intense agricultural systems. Such agro-ecological systems are potentially better adapted to local environmental conditions and to social and economic requirements. Transition of current agriculture to agro-ecological systems leads to more sustainable and climate responsive agricultural production. Such a transition is a relevant contribution to the implementation and success of the EU Green Deal and EU policies on biodiversity, on circular economy and on climate change. This approach towards agro-ecological systems fits the recommendations by the Mission Board on Soil Health and Food and the Farm to Fork Strategy and will contribute to reach the target "25% of agricultural land under organic farming".
This agro-ecological transition can be considered as a highly potential opportunity to respond in particular to changes and challenges posed by climate change across the European continent. Examples and experiences include better soil exploration by deep rooting in mixed crops or deep rooting crops to enhance water and nutrient availability. Also, facilitation of symbiosis of roots with microbes may enhance nutrient uptake. More soil carbon will stimulate soil biodiversity and enhance resilience to climate change and climate variability and ability of soils to sustain more frequent extreme events (prolonged drought, extreme wet conditions, extended warm periods, and higher risk for diseases to occur). However, the impact of the transition to agro-ecology on the resilience of agroecosystem to climate change in many European regions is poorly understood and documented, especially for its soil component. Understanding and quantifying this impact is particularly relevant when the climate is changing and forces local and regional agricultural systems to adapt.
To date, most long-term experimental studies and meta-analyses on the effects of management on agricultural soils have focused on the impact of a single practice or a specific technology. As a consequence they have not considered scope and options of the full context of an agro-ecological farming system, nor considered the broad range and diversity of agricultural systems that exist in Europe. These alternative and new systems and practices need to meet multiple goals on soil health, agricultural production, climate change adaptation and mitigation and support and sustain ecosystem services. These systems also need to be recognized by local farmers to fit their specific conditions and socio-economic needs and perceptions.
Several recent H2020/FP7 projects among others have investigated elements concerning soil degradation processes and remediation practices, the assessment of soil's contribution to the provision of ecosystem services and relations to climate change mitigation. This project will utilize and build upon the knowledge and data provided in these recent and completed FP7/H2020 projects.

Scope: The agro-ecological systems and the underlying climate-smart sustainable soil management practices considered in this project will be selected on their *a priori*

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

positive effect on climate change adaptation and mitigation (e.g., agroforestry, conservation agriculture, organic farming, integrated crop-livestock-forestry systems). This will be combined with their actual adoption or potential for adoption by farmers in climate regions and agro-ecological zones across the EU and relate to the projected climate change. This will require the sourcing and use of results of completed projects and existing data in EJP SOIL.
The research will evaluate soil functions and ecosystem services provided by soils in relation to climate change adaptation and mitigation. This will include the provisioning service for food, the ability of the soils to contribute to climate change mitigation (conserve or increase SOC stocks, decrease N_2O emissions), and the ability of soils to contribute to climate change adaptation (e.g. soil water infiltration & storage and yield stability). The research will use available tools (existing models and indicators). The project will identify and use, and adapt if needed, a series of long term and highly instrumented case studies in different pedo-climatic conditions. This will be based up on long term experiments (LTE's) of the EJP SOIL consortium allowing for retrospective analysis of soil conditions, crop yields and climate conditions and change. In complement, the project will also identify pioneer farmers in different EU countries as lighthouse farms to enhance the regional applicability and allow farmers to recognize their local conditions and systems. This research could also be performed by modelling the complex soil – plant interactions in agro-ecological systems, to evaluate them regarding their resistance and resilience under different climate scenarios (RCPs). These different research approaches can be combined.

Expected outcomes:

- Identify and report on the effect of climate variability across EU agro-ecological zones on soils and crop in various agro-ecological systems.
- Assess the impact and contribution of soils and soil management across the range of agroecological systems to climate mitigation and adaptation and relate to future regional climate conditions.
- Develop and propose guidelines for soil management to fit the complex and diverse agroecological systems in different EU pedo-climatological and environmental zones.

Project outcomes should feed into the to be realized partnership on agro-ecology and living labs.

Expected impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI5: Fostering the uptake of soil management practices which are conducive to climate change adaptation and mitigation.

Project Type: Large size research project (up to 5M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Topic: Sustainable production (SP)

SP1 Alleviating soil compaction in a climate change context

Rationale/specific challenge: Soil compaction is considered a major European soil health challenge, and a threat for the soils' capacity to deal with climate mitigation and adaptation. The historical changes of compaction levels were shown to coincide with a stagnation in crop yields in the 1990s for cereals in many European countries (Keller et al. 2019)[16]. Soil compaction restricts root growth and thereby the uptake of nutrients and water leading to yield losses and reduced carbon input to both top- and subsoil. Soil compaction also affects the timeliness of soil operations especially in a changing climate, which may also affect crop yields (Kolberg et al. 2020)[17]. Thus, alleviation of soil compaction is critical for sustained or increased soil carbon storage and accounting for soil compaction effects may be necessary in forecasting the evolution of SOC stocks in European soils. Climate change is also expected to strongly worsen the soil compaction problem. Impeded root growth due to soil compaction will aggravate effects of more frequent droughts with detrimental effects on yields and carbon input. Soil compaction-induced restricted water transport will also exacerbate problems with flooding in a future climate with more extreme rainfall events (Keller et al. 2019). There is a strong need for an analysis of the impact of climate change on the extent and the effects of soil compaction. The extent and severity of the soil compaction challenge is strongly related to soil management in terms of field traffic with heavy machinery and livestock trampling. The extent of the soil compaction and the impacts on climate change adaptation, soil carbon storage and soil health in general needs to be quantified at EU scale for different pedo-climatic conditions and cropping systems. Strategies to limit the risk of soil compaction in a climate change context need to be developed with focus on traffic intensity, weight of machinery and timing of operations. Novel advanced technologies in the field of digital farming and robotisation may be applied to significantly reduce the soil compaction problem, but this has been scarcely researched. There is also a need for better knowledge on the recovery of compacted soil and the development of bio-based strategies to stimulate recovery.

Scope: The scope of project is to analyze how climate change affects the extent of soil compaction and how soil compaction affects the capacity of soils to adapt to climate change and mitigate it. For this the project will quantify the extent and severity of the soil compaction problem at EU scale for different pedo-climatic conditions and cropping systems considering both topsoil and subsoil compaction. The project will analyze and develop management strategies that reduce risk of compaction and stimulate the recovery of compacted soil. Management strategies will be developed and tested in collaboration with farmers. The project will gather knowledge from past and current EU and national activities and initiate targeted measurements and modelling activities to fill in significant knowledge gaps.

Expected outcomes:

[16] Keller, T., Sandin, M., Colombi, T., Horn, R., Or, D., 2019. Historical increase in agricultural machinery weights enhanced soil stress levels and adversely affected soil functioning. Soil and Tillage Research 194.

[17] Kolberg, D., Riley, H., Børresen, T., 2020. Timeliness and traffic intensity in spring fieldwork in Norway: Importance of soil physical properties, persistence of soil degradation, and consequences for cereal yield. AGRICULTURAL AND FOOD SCIENCE 29, 154–165.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

- Analysis of the impact of soil compaction in a changing climate.
- Quantifying the extent and severity of the soil compaction problem for different pedo-climatic conditions and cropping systems under climate change.
- Improved knowledge of management strategies and technologies to reduce risk of soil compaction and the recovery of compacted soil in a climate change context.

Expected Impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

SP2 - The use, processing and application of external sources of organic matter to mitigate climate change and improve soil health

Rationale/Specific challenge: Encouraging the recycling of organic wastes into renewable fertilizers or amendments and promotion of shorter value chains and circular (bio)-economy to improve soil health is a priority in the EU agenda (Farm to Fork Strategy, Green Deal, Mission Board for Soil Health and Food, Horizon Europe). The Green Deal increased Europe`s ambitions regarding climate change mitigation with an objective of zero net GHG emissions by 2050 (European Commission, 2019)[18]. There will be the need to use the full potential of European Soils for mitigation and adaptation strategies, in particular by increasing the soil organic carbon pool in agricultural soils by implementing sustainable soils management practices (Montanarella and Panagos, 2021)[11]. Adding external sources of organic matter to soils as fertilizers or amendments is a sustainable management option (FAO, 2017)[19]. Adding manures and composts has been considered in several previous EU projects as part of soil improving cropping systems and best management practices. An increasing diversity of new organic resources are becoming available for farmers (biochars, digestates, human wastes derived fertilizers) besides more traditional ones (composts, manures). Yet, these resources remain insufficiently studied in terms of SOC storing capacities, GHG balance, improvement of the capacity of soils to infiltrate and retain water, fertilizing values and nutrient losses and environmental safety due to the potential presence of contaminants. More generally, the characterization of organic wastes is insufficiently developed to guide their use for selected objectives such as climate change mitigation. This lack of knowledge hinders the optimal integration of organic wastes in farming systems for climate change mitigation and sustainable production. Increasing organic waste valorization under a circular approach brings also new questions at the territory level, as related to the organizational links between arable crops and animal farming, urban and rural areas, agriculture and waste recycling sectors.

Scope: The aim is to gain knowledge on the use, processing and application of external sources of organic matter to mitigate climate change while maintaining sustainable production and improving soil health. The project will address following research questions:

- What is the impact of resource quality of the range of potential external organic matter sources on SOC storage and stabilization?
- What is the impact of climatic conditions, soil characteristics and initial soil organic matter contents (pedo-climatic zones) on the expected life time of organic C additions across soils?
- What - if any - restrictions apply to the amount of exogenous organic matter that can be added safely (no loss of soil quality) and effectively in terms of climate change mitigation (*net* gain of SOM and *net* reduction of GHG emissions without trade-offs)?
- What are preferred management options in terms of how and when to amend exogenous organic matter considering soil depth, ploughing, fertilization,

[18] European Commission,, 2019. The European Green Deal COM/2019/640 final.

[19] FAO, 2017. Voluntary Guidelines for Sustainable Soil Management.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

irrigation, and accounting for approved standards for safe and effective use of organic amendments?
- What processing options before returning organic matter to soils are available and effective to enhance formation of stable organic matter in soils as compared to direct return and how can technologies be evaluated? The project should determine what is the C budget and the impact on GHGs and nutrient release during processing and storage and after soil application. Potential trade-offs and thresholds between short-term nutrient release and long-term C sequestration should be analyzed.

The project should carry a synthesis of existing knowledge, integrate information from on-going experiments (including EJP SOIL long-term experiments) and perform targeted new studies on the short- and long-term effects of organic resources for different pedo-climatic conditions and cropping systems. The knowledge gained will be used to refine existing decision support tools for selecting suitable and cost-efficient strategies at the territorial level to make the best use of the local organic resources accounting for agro-pedo-climatic characteristics, crop and farming systems, organic resource availability, production and transport costs. The aim is to include in such decision support systems several criteria and soil functions (carbon sequestration and GHGs emission, nutrient cycling, soil structure, soil biodiversity) and to lead to recommendations of standards for safe and effective use of organic resources that allow for climate change mitigation (targeting farmers and also the waste recycling sector).

Expected outcomes:
- Improvement of knowledge of the capacity of traditional and new external organic resources to mitigate climate change, while maintaining sustainable production and soil health.
- Better capacity (knowledge and proposed tools) to make the best use of local organic resources, considering the advantages/ drawbacks of processing options before adding the organic resources to soil and considering organic resource availability at the territory scale.

Expected impacts:
- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI2: Understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon.
- EJP SOIL EI6: Developing region-specific fertilization practices considering the local soil, water and pedo-climatic conditions.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Topic: Harmonizing soil information (DATA)

DATA1 - Innovative techniques to monitor SOC stocks and soil degradation/restoration changes in the EU, using spectral systems/NIRS/MIRS, and other proximal sensing tools

Rationale/Specific challenge: SOC stocks and soil quality (degradation/restoration) evolve under the combined effects of land use, soil management and climate change. These dynamics may be quite fast (decades) and are insufficiently known and monitored as traditional monitoring methods are expensive and time consuming. Much faster and high throughput methodologies of soil characterization are needed to meet the needs of soil policies, such as assessing changes in soil condition, SOC and erosion rates under agricultural management in the CAP context, or assessing soil nutrient status in the context of the Farm to Fork strategy targets (European Commission, 2020)16. Soil spectroscopy (both near and mid infra-red, i.e. both NIRS and MIRS) has been developed in the last years and various proximal sensing techniques offer promising technologies to speed up and reduce the costs of the soil surveying activity. Spectral libraries already exist at different levels: national (or regional) spectral libraries in several of the EJP SOIL partner countries and the LUCAS spectral library that is the most comprehensive and freely available. Some initiatives for combining and harmonizing these spectral libraries also exist, such as the work made by the GLOSOLAN working group on spectroscopy. However, there is still a need for further harmonization of spectral measurements. Calibration in relation to the laboratory analysis as well as producing procedures to derive soil parameters from soil spectra are needed to fully validate these techniques and allow them to be deployed at a large scale in Europe. Proximal sensing is complementary to remote sensing approaches developed, e.g. for SOC monitoring, in the EJP SOIL STEROPES project and in the ESA WorldSoil projects.

Scope: The project will focus on the use of proximal sensing for soil monitoring in the field, and will aim to validate proximal sensing techniques for estimating soil properties (e.g. carbon content, soil texture, pH, nutrient contents etc.). The project should investigate the reliability and applicability of such spectroscopic techniques. A key point will concern calibration of the different estimated soil properties with actual measured data. Developing inter-comparisons is relevant for this topic, e.g. the same soil samples contemporarily analyzed by reference European laboratory and scanned for its spectra. Using freely available spectral libraries such as LUCAS, national and other spectral libraries and cooperation with international spectroscopic harmonization activities (like GLOSOLAN, IEEE) is encouraged. A critical analysis of innovative tools and methods in terms of accuracies and harmonization of soil spectral libraries is expected in order to evaluate their potential use for rapid and low-cost assessment of soil properties. The project should deliver a list of soil characteristics that can be determined by validated proximal sensing methods.
In a potential secondary step, this project could also determine the advantages and limitations of combining proximal and remote sensing. This combination would permit to enlarge the evaluations done at one site by proximal sensing, to larger areas, using the same sensors (for example VIS-NIR), For this step, cooperation should be sought

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

with the EJP SOIL project STEROPES and WorldSoils and possibly other research initiatives.

Expected outcomes:

- Improving the development and availability of proximal sensing methods allowing to speed-up the monitoring of soil characteristics in the field, that could possibly be used directly by farmers (citizen science) or for soil monitoring at the national and the European scale.

Expected impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI4: Supporting harmonized European soil information, including for international reporting.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

SE2/INDICATORS 1 Modelling soil functions and soil threats for mapping soil functions and ecosystem services

Rationale/Specific challenge: Modern agriculture is in many cases contributing to continued soil degradation. The effects are severe depletion of soil organic matter (SOM) content, accelerated erosion, reduced soil water holding capacity, loss of soil biodiversity, salinization, soil pollution and increased GHG emissions (FAO and ITPS, 2015[20]; EEA, 2015; 2019[21]). These ongoing degradation processes impede agricultural soils to fully contribute to the provision of ecosystem services such as food and fibre production, climate change mitigation, disaster management (floods and droughts) and biodiversity-based control regulations (IPBES, 2018; 2019; IPCC, 2019; ECA, 2018[22]). In addition, there is an increasing need to be able to assess and predict the ability of soils to perform given functions for implementing climate-smart sustainable management options. Recently, several EU projects have concerned the reporting on soil degradation processes and the assessment of soil contribution to the provision of ecosystem services. Different concepts (e.g. soil quality, soil health) and indicators have been implemented across countries. Some indicators have been used in decision support tools to assess the multi-functionality of soils. However, indicators based on soil properties still need to be improved, tested on a variety of pedo-climatic conditions and shared with end-users (farmers). Also, common reference and/or threshold values have to be set, covering the diversity of soil types, climatic conditions and agricultural production systems at the European scale.

Scope: The EJP SOIL funded a first project to take stock on existing indicator systems for assessing soil quality and ecosystem services, including reference values for agricultural soils, as currently used by Member States associated in the EJP SOIL and beyond. However, the validity of these indicators and reference values remains to be tested to be able to produce detailed map of soil functions at the EU scale. Therefore, the main aim of the project is to use, test and improve the robustness and sensitivity of existing indicators and their interpretation values (e.g. reference and/or threshold values) to model and map soil functions and related ecosystem services, focusing especially on climate change adaptation and mitigation.
Interpretation/ reference values should be evaluated and, or, developed for different combinations of soil types and agricultural land uses (cropland, grassland, agroforestry). Such values should ideally be defined in collaboration with the JRC/ESDAC and DG ENV. The project should consider region-specific challenges since soil threats differ among EU regions. Modelling and mapping issues should particularly concern the temporal dynamics of soil degradation and soil functions as related to climate change and changing agricultural practices and land-use (cropland, grassland, agroforestry). The project will release a geodatabase on soil degradation and soil functions based on tested indicators at the EU scale. The relevance and incurred cost of using these indicators will be analysed from a policy perspective.

[20] FAO and ITPS, 2015. Status of the World's Soil Resources (SWSR) – Main Report. . Food and Agriculture Organization of the United Nations and Intergovernmental Technical Panel on Soils, Rome, Italy.
[21] EEA, 2015. The European environment — state and outlook 2015: an integrated assessment of the European Environment. - EEA, 2017. Climate change, impacts and vulnerability in Europe 2016 An indicator-based report.
[22] Scholes , R., Montanarella, L., 2018. Thematic assessment of land degradation and restoration. IPBES Report - IPCC, 2019. Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security,and greenhouse gas fluxes in terrestrial ecosystems. IPCC Special report.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Participatory approaches involving end-users and farmers are encouraged, in order to share knowledge on the multi-functionality of soils, to test and improve soil indicators and decision-support tools in real local conditions and to demonstrate the benefits of climate-smart sustainable soil management.

Expected outcomes:

- Improving decision-support systems for farmers adapted to different EU agricultural systems and soil conditions and helping to evaluate and design best management options.
- Improving availability of models and geodatabase allowing to assess the effect of ongoing/possible soil threats and/or of agricultural soil management options on the provision of soil functions and ecosystem services.
- Knowledge allowing for a better harmonization of systems and references for evaluating soil functions and ecosystem services across Europe.

Expected impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI4: Supporting harmonized European soil information, including for international reporting.
- EJP SOIL EI5: Fostering the uptake of soil management practices which are conducive to climate change adaptation and mitigation.

Project Type: Large size research project (up to 5M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

SE4/INDICATORS 2 European soil biodiversity forecast towards resilient agroecosystems in response to climate change

Rationale/Specific challenge: Soil biota are key in the functioning of soils and their contribution to ecosystem services. Yet, relatively little is known about the functional role of soil biodiversity and how belowground functional biodiversity can be stimulated to enhance soil functioning or provide resilience to climate change and adverse conditions such as drought or soil borne diseases. Little is also known as to what levels of biomass or activity of the soil biota would be desirable in the perspective of sustainable and climate-smart agriculture and the provision of multiple ecosystem services including climate change mitigation and soil borne disease controls.
The current status of soil biodiversity in Europe waits to be assessed (FAO-GSP-ITPS 2020[23]). Therefore, both scientific research and policy instruments are needed. In particular in the light of EU Biodiversity Strategy, advances are expected concerning the development of functional indicators and target values for healthy soils and the expected soil functions and ecosystem services, in relation to soil types, land uses and climate zones to cover all relevant (soil) conditions.

Scope: The project is expected to use concepts, results and samples from previous projects and Long Term Experiments available through EJP SOIL partners. The project will be complementary to ongoing national and H2020 projects and in doing so will cover all regions and climate conditions across EU27. The objective is to provide at the European scale, regionalized maps of soil biodiversity and biodiversity decline, for various biological groups (bacteria, fungi, micro, meso and macro invertebrates) and selected associated functions (e.g. organic matter decomposition, nutrients provision, water retention, susceptibility to soil borne diseases) in agricultural soils. This will require the identification and selection of relevant indicators describing soil biodiversity from previous and ongoing projects. The focus will be especially on selected taxonomical and functional indicators and their evolution as a result from both climate conditions and from implementation of specific soil management actions to respond to climate change. Reference values for the selected functional indicators will be identified and time series established from archived soil samples to relate biodiversity to climate conditions and climate changes anticipated.
Time series of chrono sequences on soil biodiversity records in relation to climate sensitivity would be particularly helpful to indicate sensitivity to climate and agricultural soil use, e.g. from LUCAS or other archived soil samples and using PCR / DNA technology or other identification methods. The project will collect existing biodiversity data by EJP SOIL partners and EU countries. It will also use the existing knowledge and metadata related to soil type (national and commercial soil analyses; EJP SOIL Meta database), agricultural land use (cropland, grassland, agroforestry) and soil management in order to develop models for mapping soil biodiversity and related functions. Options will be identified to manage soil biodiversity and enhance soil quality and the challenges to adequately respond to climate change.

Expected outcomes:

[23] FAO, ITPS., GSBI, SCBD and EC., 2020. State of knowledge of soil biodiversity - Status, challenges and potentialities. Report 2020, FAO, Rome.

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

- Proposing functional indicators of soil biodiversity in relation to soil ecosystem services by connecting to existing and complementing the framework with the relevant parameters developed in e.g., SFS_21 projects and national programs where appropriate;
- Sourcing data from previous projects and commercial soil analyses to produce maps of the current values and/or levels of these indicators at the EU scale to identify regional differences;
- Providing for climate responses and sensitivities of soil biodiversity indicators on the basis of archived soil analysis;
- Identifying thresholds and target values for biodiversity indicators and identification of policy instruments to address and enhance soil quality where appropriate with measures and actions.

Expected impacts:

- EJP SOIL EI1: Fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment.
- EJP SOIL EI4: Supporting harmonized European soil information, including for international reporting.

Project Type: Medium size research project (up to 2M€).

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Topic: Science policy interfaces (POL)

POL2/ES7 - Enabling conditions for climate smart and sustainable soil policy: fair and functional incentives for ecosystem services related to climate mitigation and sustainable production

Rationale/Specific challenge: Soil is part of the natural environment in the same way as air and water, however, there is no direct policy at the EU level dedicated to soil protection or enhancing the capacity of soil to provide different functions (primary productivity, nutrient cycling, water purification and regulation, climate regulation with C sequestration and habitat for biodiversity and biological processes). Across the EU, and more globally, there is increasing awareness of climate change and biodiversity losses, their linkages and impacts amongst society. Growing concerns about soil health, carbon sequestration and climate mitigation are compelling governments to develop policies to protect their citizens' health and livelihoods, their natural environment and resources. Healthy soils, in direct line with human health and ecosystem health, are and become a more and more important topic for policy makers. The Mission Board on Soil Health and Food had proposed an ambitious target that 75% of European soils should be healthy by 2030 (Veerman et al. 2020)[24].
To enable the creation and updating of soil related policies, a number of conditions are currently prohibiting the payment schemes for ecosystem services provided by soils, that would help to give soil a higher value in policy and public perception. Farmers, especially from low-income categories should be encouraged with such payments, in particular through carbon farming schemes. A challenge is to account for the large diversity of farms between and within EU countries. Research is needed to support policy stakeholders to visualize the different challenges for climate-smart and sustainable soil management across different spatial scales, farming systems and environmental zones, to identify the best policies and their fair and effective implementation to support such payments.

To overcome the current soil policy fragmentation and improve policy cohesiveness in relation to climate, soil protection and health and to enable policy stakeholders to develop, implement and monitor future agricultural soil policies, there is the need to (i) identify synergies and trade-offs between existing policies across different scales to enable strategic policy decision making and support the selection of integrated and cross cutting specific policies for soil protection measures and management practices; (ii) to support scientific knowledge sharing with policy stakeholders and develop new frameworks for future soil policy and eco-scheme development and for carbon accounting initiatives; possibly looking the other way: punish polluters/emitters instead of rewarding clean production; (iii) to provide suitable tools and indicators/guideline values to enable better policy implementation and monitoring at multiple scales. While

[24] Veerman, C., Correia, T.P., Bastioli, C., Biro, B., Bouma, J., Cienciala, E., Emmett, B., Frison, E.A., Grand, A., Filchew, L.H., Kriaučiūnienė, Z., Pogrzeba, M., Soussana, J.-F., Olmo, C.V., Wittkowski., R., 2020. Caring for soil is caring for life – Ensure 75% of soils are healthy by 2030 for food, people, nature and climate. Report of the Mission Board for Soil health and food. ISBN 978-92-76-21602-5 European Commission Directorate-General for Research and Innovation and Directorate-General for Agriculture and Rural Development Directorate B — Quality, Research & Innovation, Outreach Unit B2 —Research and Innovation, Brussels.https://ec.europa.eu/clima/events/2nd-carbon-farming-roundtable_en

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

rewarding organic carbon sequestration in soils receives much attention (e.g., on-going Carbon Farming study led by DG CLIMA16 and recent LIFE 2020 call on enabling carbon farming[25], solutions for promoting the delivery of ecosystem services by soils are less studied.

Scope: This research should analyze the proposed/perceived solutions (financial and market-based incentives, voluntary and mandatory initiatives) to address the identified socio-economic barriers and levers for increasing carbon sequestration and promoting soil health in agricultural soils, i.e., promoting the delivery of ecosystem services by soils. It should go beyond analyzing subsidy-based policies for adapting agricultural practices and systems (e.g., Common Agricultural Policy farm-level payments), to consider rewarding systems based on market solutions and/or sector-specific innovative contract schemes between farmers and agri-food industry and retailers. Such initiatives are best seen as complementary to policy instruments, or substitute if deemed more cost-effective.

Regarding rewarding farmers for SOC storage, the project should consider the following elements for a carbon farming scheme: (i) on-farm C balance and forward-looking calculations of C sequestration over 10-20 years (lifetime of the agreement), based on choices of changing practices and farming systems, (ii) an analysis of risks, responsibilities, and solutions to meet a target and deliver C sequestration and (iii) a payment scheme that covers benefits and returns to farmers in terms of risks and insurance, and defines responsibilities in the event of non-delivery or interruption of agreed services and performance. The study should analyze how rewarding schemes, in particular results-based ones, taking explicitly into account soil properties, interactions between soils and agricultural practices, may be developed for ecosystem services delivered by agricultural soils, including C sequestration. As mentioned above, besides farm-level payments envisioned in the future CAP (Euro Schemes), the project should consider complementary actions to reward farmers, moving away from subsidy-based policies and bringing in more cost-effective market solutions.

This will require to consider different issues regarding: availability of soil properties, their spatial resolution and uncertainties, criteria for indicators selection, baseline, additionality, reversibility and long-term trends, control and verification of results, training and expertise required, accounting of previous work of pioneers, the design of the reward, cost-effectiveness of the payment scheme, agricultural product labelling, social perception from soil up to agri-food chain. These activities will be done in a multi-actor approach, involving stakeholders from all areas of Europe and associating different disciplines (soil scientists, economists and social scientists).

Outputs: An analysis of the strengths and weaknesses of a result-based payment approach for soils and proposals for appropriate payment schemes. Fair and transparent “strengths and weaknesses” analysis of expected impacts of subsidy systems and other rewarding schemes, including opinions of diversified stakeholders with an objective of equity. Criteria for indicators selection. Analysis of a result-based payment approach or polluter/emitter pays schemes.

[25] https://ec.europa.eu/easme/en/section/life/2020-call-proposals-preparatory-projects-second-round

These projects have received funding from the European Union’s Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Expected outcomes:

- Development of carbon farming schemes and payment schemes for ecosystem services, adapted to regional conditions.

Expected impact:

- EJP SOIL EI5: Fostering the uptake of soil management practices which are conducive to climate change adaptation and mitigation.

Project Type: Medium size research project (up to 2M€)

These projects have received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement No. 862695.

Annex 3. Proposal template

Acronym

Title

Coordinator: XXX

Proposal for EJP SOIL 2nd Internal Call topic: XXX

[Date of submission]

Table of Contents

1. Project information

Title and acronym:

Keywords:

Duration in months:

Topic:

Project leader: *Organization name and affiliation*

Publishable summary: *in max 800 characters incl. spaces*

2. Information of participating beneficiaries and linked third parties

Filled by each beneficiary, third linked part and the project coordinator.

2.1. Beneficiary and/or Linked Third Party no. 1

Organization:

Responsible person at the organization:

Role of beneficiary/linked third parties in the project
Max. 1000 characters; including fields of expertise and related to topic ongoing projects (including project name, funder, amount, overlaps and links with current proposal)

Tasks of the beneficiary and linked third parties in the project:
Max. 1500 characters

2.2. Beneficiary and/or Linked Third Party no. x

Organization:

Responsible person at the organization:

Role of beneficiary/linked third parties in the project
Max. 1000 characters; including fields of expertise and related to topic ongoing projects (including project name, funder, amount, overlaps and links with current proposal)

Tasks of the beneficiary and linked third parties in the project:
Max. 1500 characters

3. Summarized project budget

In k€ total budget; Please use XLS template for planning; see Annex 4. Short narrative explanation for each budget item listed in table 1 (max 800 characters incl. spaces plus Table 1). ***Avoid outstanding "other costs"; costs that exceed 15% of the personnel costs*** *(please contact the Call Office [EJPCO@maapera.fi] in case outstanding costs are expected**).***

Table 1: Summarized project budget

	Amount in k€
Personnel costs	
Consumables	
Durable equipment	
Travel and subsistence	
Other costs#	
Sub-contracting	
Indirect costs*	
Total budget	

 # Includes budget for communication, dissemination and exploitation activities; see for more information in the proposal template, section 6 "Communication strategy".
** Indirect costs: 25% of the total direct costs (personnel costs, consumables, durable equipment, travel and subsistence and other costs) minus subcontracting costs.*

4. Description of the work

Max 18.000 characters with spaces; in addition the work package descriptions and work plan that are part of section 4.2.

4.1. Relevance of the research proposal

Objectives and main hypotheses

Relevance to the topic

4.2. Research Approach

General approach and methodology

Brief description of the work plan
(including provisional project structure, work packages, work plan and collaboration among beneficiaries and/or linked third parties)

Table 2: Work packages (WPs), start and end months (i.e. EJP SOIL months), and number of person months.

Work package	**Lead participant***	**Person-months**	**Start month***	**End month***
WP1:			MXX	MXX
WP2:			MXX	MXX
WP3:			MXX	MXX
WP4:			MXX	MXX
WP5:			MXX	MXX
WP6:			MXX	MXX
WP7:			MXX	MXX
	Total person months:			

** EJP SOIL months; M01 equals February 2020*

Table 3: Descriptions of the work packages (WPs). The following pages contain tables detailing the participants (i.e. beneficiaries and linked third parties [LTP]), start and end months (i.e. EJP SOIL months; M01 equals February 2020), number of person months, objectives (OB), tasks (T) & deliverables (D) of each WP.

Work package	**WP1:**
Lead beneficiary or LTP	*full name (acronym)*
Deputy leader	*full name (acronym)*

Beneficiary no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Abbreviation	INRAE	WR	BIOS	EV-ILVO	CRAW	CULS	AU	EMU	Luke	vTI	Juelich	MTA-ATK	Teagasc
Person-months													
Beneficiary no.	14	15	16	17	18	19	20	21	22	23	24	25	26
Abbreviation	CREA	UL	LAMMAC	NIBIO	IUNG	INIAV	NPPC	ULBF	INIA	SLU	AGS	TAGAM	AFBI
Person-months													
LTP no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Abbreviation	AgroParisTech	ACO	SupAgro	EAA	BOKU	AGES	BAW	BFW	EV INBO	VPO	ARC	CNR	ISPRA
Person-months													
LTPno.	14	15	16	17	18	19	20	21	22	23	24	25	26
Abbreviation	UNIPA	ENEA	AGRIS	ERSAF	AIS	UM-FKBV	CSIC	-/-	-/-	-/-	-/-	-/-	-/-
Person-months													

Start month	MXX	**End month**	MXX	**Total person-months**	**XX**

Objectives

- *Describe the overall objective of the WP (max. 7 lines).*
- *List the specific objectives of the WP, including a descriptive but concise title, followed by a description.*
- *A commonly used approach, which helps to boost clarity, is link objectives directly to tasks, i.e. OB1.1 is dealt with by T1.1.*

The specific objectives are to:

- **OB1.1: TITLE:** DESCRIPTION
- **OB1.2: TITLE:** DESCRIPTION
- **OB1.3: TITLE:** DESCRIPTION
- **OB1.4: TITLE:** DESCRIPTION
- **OB1.5: TITLE:** DESCRIPTION

Description of work

- *Background: Describe the state-of-the-art in the field(s) relating to the WP, in particular the starting basis for the work, and gaps that the WP will bridge (max. 8 lines, as it has already been outlined in **Section 4.1**).*
- *Approach: Describe the overall approach adopted by the WP, in order for it to achieve its objectives (max. 8 lines).*
- *Tasks: List the tasks (and subtasks), including a descriptive but concise title, followed by the task leader(s) and participants, and description, which should also clarify the roles of each participant.*
- **T1.1:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.2:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.3:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.4:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.5:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.6:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.7:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T1.8: TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION

Deliverables (see Table 4)

Milestones (see Table 5)

Beneficiary no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Abbreviation	INRAE	WR	BIOS	EV-ILVO	CRAW	CULS	AU	EMU	Luke	vTI	Juelich	MTA-ATK	Teagasc
Person-months													
Beneficiary no.	14	15	16	17	18	19	20	21	22	23	24	25	26
Abbreviation	CREA	UL	LAMMAC	NIBIO	IUNG	INIAV	NPPC	ULBF	INIA	SLU	AGS	TAGAM	AFBI
Person-months													
LTP no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Abbreviation	AgroParisTech	ACO	SupAgro	EAA	BOKU	AGES	BAW	BFW	EV INBO	VPO	ARC	CNR	ISPRA
Person-months													
LTPno.	14	15	16	17	18	19	20	21	22	23	24	25	26
Abbreviation	UNIPA	ENEA	AGRIS	ERSAF	AIS	UM-FKBV	CSIC	-/-	-/-	-/-	-/-	-/-	-/-
Person-months													

Start month	MXX	End month	MXX	Total person-months	XX

Objectives

- *Describe the overall objective of the WP (max. 7 lines).*
- *List the specific objectives of the WP, including a descriptive but concise title, followed by a description.*
- *A commonly used approach, which helps to boost clarity, is link objectives directly to tasks, i.e. OB2.1 is dealt with by T2.1.*

The specific objectives are to:

- **OB2.1: TITLE:** DESCRIPTION
- **OB2.2: TITLE:** DESCRIPTION
- **OB2.3: TITLE:** DESCRIPTION
- **OB2.4: TITLE:** DESCRIPTION
- **OB2.5: TITLE:** DESCRIPTION

Description of work

- *Background: Describe the state-of-the-art in the field(s) relating to the WP, in particular the starting basis for the work, and gaps that the WP will bridge (max. 8 lines, as it has already been outlined in **Section 4.1**).*
- *Approach: Describe the overall approach adopted by the WP, in order for it to achieve its objectives (max. 8 lines).*
- *Tasks: List the tasks (and subtasks), including a descriptive but concise title, followed by the task leader(s) and participants, and description, which should also clarify the roles of each participant.*

The work will be conducted via the following tasks:

- **T2.1:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.2:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.3:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.4:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.5:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.6:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.7:TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION
- **T2.8: TITLE** (***leader***, ***co-leader***, *participants*): DESCRIPTION

Deliverables (see Table 3)

Milestones (See Table 4)

Table 3 : List the deliverables, including a descriptive but concise deliverable title, responsible participant, month of delivery, and description

Deliverable	WP	Month of delivery	Responsible participant	Title	Description
D1.1	1	MX		Title	Description
D1.2	1	MX			
D1.X	1	MX			
D2.1	2	MX			

DX.X	X	MX			

Table 4 : List the milestones, including a descriptive but concise milestone title, responsible participant, month of achieving milestone, and description.

Deliverable	WP	Due month	Responsible participant	Title	Description
M1.1	1	MX		Title	Description
M1.2	1	MX			
M1.X	1	MX			
M2.1	2	MX			
MX.X	X	MX			

Table 5: *Example of a Gantt chart illustrating the timing of project`s tasks (T), deliverables (D) and milestones (M). The EJP SOIL annual work plans are based on a* ***monthly resolution****, which also applies to EJP SOIL internal call funded research project.*

	1st Annual period first work plan											
Months*	1	2	3	4	5	6	7	8	9	10	11	12
WP1												
T1.1												
D				X								
M				X								
T1.2												
T1.3												

* EJP SOIL months; M01 equals February 2020
WP: Work package

4.3. Impact

Expected impact (considering cross-cutting issues: multi-actor/ multi-disciplinary and system approach)

Innovation potential (ambition and novelty in relation to the state of the art)

Added value of the transnational collaboration and geographical relevance

5. Ethical issues

Indication that the research project is carried out in accordance with the European Union, the respective national (Chapter 5 and Annex 5 "Self-assessment"), and the EJP SOIL`s requirements. Proposals that do not include all the compulsory information or do not meet the formal requirements of the Call announcement will not be considered for funding.

Address any of the ethical issues listed in Annex 5 that are expected to arise during the proposed project. In max. 6000 characters with spaces.

6. Communication and dissemination strategy

On the basis of an internal EJP SOIL communication and dissemination services and tools (see section "Communication and dissemination") the applicants should consider the following communication and dissemination options during communication plan preparation (in max 6000 characters with spaces):

- *Describe how the funded research is relevant for particular stakeholders;*
- *Specify how the project will engage and interact with these on both national and European level;*
- *Specify communication, dissemination and knowledge exchange activities such scientific papers, articles, posters, course or training material, web-based tools, as workshops or field days;*
- *Specify activities including (co)organizing national workshops in member states funding the project;*
- *Specify how they will draw upon relevant professional assistance from WP9 and National Communication Representatives to secure communication, dissemination and exploitation activities;*
- *Appoint a Project Communication Representative who will be responsible for communication, dissemination and exploitation activities in the project;*
- *Include summarized budget lines for communication, dissemination and exploitation activities.*

7. Data management strategy

Describe how the research data in this project will be findable, accessible, interoperable and re-usable (FAIR) (in max 6000 characters with spaces):

- Describe the handling of research data during and after the end of the project;
- Specify what data will be collected, processed and/or generated and/or reused;
- Specify which methodology and standards will be applied;
- Specify whether data will be shared/made open access;
- Specify how data will be curated and preserved (including after the end of the project).

8. References

Please us citation style of the European Journal of Soil Science (https://onlinelibrary.wiley.com/journal/13652389)

The closing date for complete and timely submission of proposals is 31st May 2021 in M16 – 23:59 CET. Applications should be submitted via the EJP SOIL`s proposal submission system (Link).

Annex 4: Template for proposal budget

Please, visit the EJP Website (www.ejpsoil.org) to retrieve the budget sheet template in Excel format. **Please submit Annex 4 as an Excel document, NOT as a PDF**.

Important notices regarding budget plan

- The template file is composed of several spreadsheets, one summary budget spreadsheet and as many other spreadsheets as cost items.
- Where necessary complete the yellow cells in each relevant spreadsheet
- For each cost budgeted, describe it and refer to the corresponding task(s) of the project (See Annex 3, section 3)
- Complete one file consisting of annual budget plans to be summarized in an overall data sheet.
- Name each file as:
    - Project acronym
    - Institute name
    - Project year (Y)
    - E.g.: xxxxx_Y1
- Contact the Call Office for any further clarification needed (EJPCO@maapera.fi)

Annex 5. Ethics self-assessment

Please see the EJP SOIL Website (www. EJPSOIL.eu), to retrieve the excel sheet for Ethics Self-Assessment.

EJPSOIL Ethics Self-Assessment				
Instructions: Each candidate EJP SOIL leader must complete this questionnaire. For guidance, please use the guidance document. Send the completed form to EJPfirstcall@luke.fi together with your full proposal.				
1	**HUMANS**			
	Does your research involve human participants?		Yes	No
		Are they providing sensitive or personal information?	Yes	No
		Are they volunteers for social or human sciences research?	Yes	No
		Are they persons unable to give informed consent?	Yes	No
		Are they vulnerable individuals or groups?	Yes	No
		Are they children/minors?	Yes	No
		Are they patients?	Yes	No
		Are they healthy volunteers for medical studies?	Yes	No
		Are they residents in a non-EU country?	Yes	No
	Does your research involve physical interventions on the study participants?		Yes	No
		Does it involve invasive techniques?	Yes	No
		Does it involve collection of biological samples?	Yes	No
	If your research involves processing of genetic information or collecting personal data, see also section 4			
2	**PERSONAL DATA**			
	Does your research involve personal data collection and/or processing?		Yes	No
		Does it involve the collection and/or processing of sensitive personal data (e.g.: health, sexual lifestyle, ethnicity, political opinion, religious or philosophical)	Yes	No
		Does it involve processing of genetic information?	Yes	No
		Does it involve tracking or observation of participants?	Yes	No
	Does your research involve further processing of previously collected personal data (secondary use)?		Yes	No
3	**ANIMALS**			
	Does your research involve animals?		Yes	No
		Are they legally protected animals?	Yes	No
		Are they vertebrates?	Yes	No
		Are they non-human primates?	Yes	No
		Are they genetically modified?	Yes	No
		Are they cloned farm animals?	Yes	No
		Are they endangered?	Yes	No
	Please indicate the species involved (Maximum number of characters allowed: 1000)			
4	**THIRD COUNTRIES***			
	In case non-EU countries are involved, do the research related activities undertaken in these countries		Yes	No
		Specify the countries involved:(Maximum number of characters allowed: 1000)		

		Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	Yes	No
		Do you plan to import any material - including personal data - from non-EU countries into the EU?	Yes	No
		Specify material, countries and legal permissions involved: (Maximum number of characters allowed: 1000)		
		Do you plan to export any material - including personal data - from the EU to non-EU countries?	Yes	No
		Specify material, countries and legal permissions involved: (Maximum number of characters allowed: 1000)		
		If your research involves low and/or lower middle income countries, are benefits-sharing actions planned?	Yes	No
		Do you plan to use biological resources that are subject to Access and Benefit Sharing (Nagoya Protocol) Regulations (Regulation (EU) No.511/2014; Implementing Regulation (EU) 2015/1866)	Yes	No
		Specify material and countries: (Maximum number of characters allowed: 1000)		
		Could the situation in the country put the individuals taking part in the research at risk?	Yes	No
5	**ENVIRONMENT & HEALTH and SAFETY**			
		Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	Yes	No
		Does your research deal with endangered fauna and/or flora and/or protected areas?	Yes	No
		Does your research involve the use of elements that may cause harm to humans, including research stuff?	Yes	No
6	**DUAL USE**			
		Does your research involve dual-use items in the sense of Regulations 428/2009, or other items for which an authorization is required?	Yes	No
7	**EXCLUSIVE FOCUS ON CIVIL APPLICATIONS**			
		Could your research raise concerns regarding the exclusive focus on civil applications?	Yes	No
8	**MISUSE**			
		Does your research have the potential for misuse of research results?	Yes	No
9	**OTHER ETHICS ISSUES**			
		Are there any other ethics issues that should be taken into consideration?	Yes	No
		Please specify (maximum number of characters allowed: 1000)		
I confirm that I have taken into account all ethics issues described above and that I will comply with the regulation as set out in the Grant Agreement (i.e. Art 34) before the start of any activity in which ethics issues apply			I confirm: yes or no	
Document completed by				
Date				
Signature				

* Norway, Switzerland and UK (i.e. changes will be communicated via WPs 1 and 3) are within the European Economic Area (EEA); therefore covered by the GDPR and its provisions. The only non-EU country is Turkey, which requires additional consultation of Turkish colleagues to manage personal data protections issues.

Annex 6. Certificate of co-financing

To be submitted after selection.
This template should be used for participants of selected research projects in order to provide evidence of their commitment. Grey-marked fields must be duly completed. This document must be signed by an authorized representative of the organisation. A template for each participant organization is required.

In case of failure in proving such commitment, a participant could be regarded as ineligible, jeopardizing the whole research consortium.

EJP SOIL Call Office Organisation Name Street Town Country	Address of organisation Name of contact person

EJP SOIL – 2nd Internal Call for research proposals 2021
Certificate of co-financing
Project title: …

Place, date

We hereby confirm that **organisation** has sufficient resources and is committed to participate to the **project title**, in accordance to the proposal which is submitted by coordinator in the frame of the EJP SOIL – 2nd Internal Call 2021 and in case the proposal is selected for funding by the joint Call Group.

In addition, in case of separate source of funding: Please find attached to this letter a commitment from **funding organisation** for our contribution to this project.

Signature of **Name and affiliation**

Annex 7. Letter of commitment by the project coordinator

To be submitted after selection.
This template may be signed by project coordinators of selected research projects in order to provide evidence of their commitment. Grey-marked fields must be duly completed. This document must be signed by an authorized representative of the organisation. A template for each participant organization is required.

In case of failure in proving such commitment, a project could be regarded as ineligible.

EJP SOIL Call Office
Organisation
Name
Street
Town
Country

Address of organisation
Name of Project Coordinator

EJP SOIL – 2nd Internal Call for research proposals 2021
Letter of commitment by Project Coordinator
Project full title: …
Project acronym:…

Place, date

I hereby confirm that in my capacity of the **project title** Project Coordinator, that **project title** will be implemented in accordance to the proposal submitted to the EJP SOIL Call Office and validated by the Board of Programme Managers in the frame of the EJP SOIL – 2nd Internal Call 2021.

I hereby acknowledge that **project title** will be included in the relevant EJP SOIL's Annual Work Plans that cover the complete duration of the project. As such, the **project title** will follow the rules of H2020, and the EJP SOIL Grant Agreement and Consortium Agreement with respect to scientific and financial management, data management, personal data protection, financial and technical reporting, and legal aspects such as access rights, dispute resolution and Intellectual property rights.

The relationship among the Parties, in particular concerning the organisation of the work between the Parties, the management of the Project and the responsibilities and obligations of the Parties are defined in the full project proposals provided as attachment to this letter.

Signature of **Project Coordinator**
Name and affiliation