



**Food and Agriculture  
Organization of the  
United Nations**



# European Soil Partnership Implementation Plan 2017-2020

*Note (08/06/2017) by Marc Van Liedekerke, ESP Secretariat:*

This text has been elaborated and agreed upon by meeting participants during the 4<sup>th</sup> ESP Plenary Meeting on 10-12 May 2017 at FAO HQ Rome.

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# 1 INTRODUCTION AND OVERVIEW

The Global Soil Partnership (**GSP**) is a multi-lateral initiative by FAO member countries and many other governmental and non-governmental institutions, with the vision to ensure healthy and productive soils for a food secure world, as well as sustain other essential ecosystem services on which our livelihoods and societies depend on, including water and climate regulation, biodiversity conservation and cultural services.

The **mission** of the **GSP** is to facilitate and contribute to the exchange of knowledge and technologies about soils, its sustainable management and monitoring with a view to improve soil functioning for food security, ecosystem services, and for mitigating climate change and other hazards.

The GSP is supported by 9 regional soil partnerships (RSPs), covering the whole globe. Therefore, region-specific aspects for implementation can be considered and strengthened. In Europe this is performed by the European Soil Partnership (ESP).

Given the very large geographic extent of the ESP, covering all Europe and Eurasia, the establishment of sub-regional soil partnerships is encouraged. A first sub-regional soil partnership was established for Eurasia (EASP). The EASP operates autonomously and has established its specific EASP Implementation Plan (see “Regional Implementation Plan of the Eurasian Soil Partnership: towards sustainable management of soil resources”) on the FAO GSP website.

The GSP, as well as the RSPs, are supported by national focal points for soils and other partners willing to join and contribute to the Pillars of Action. The GSP is a global network with strong regional outreach, connected to governmental soil-related activities. The ESP thus acts as an operational arm of the GSP for Europe, supporting continental soil policies and research, and building the bridge among many national and European-level activities supporting healthy soils. In the decision making process of the ESP, the national focal points from the European countries play a prominent role (see the ESP Terms of Reference).

This document outlines the planned implementation activities by the ESP during the period 2017-2020, and is structured along the 5 GSP Pillars. For each Pillar, an ESP Working Group is defined that will determine, lead and follow the implementation of a number of activities, agreed through this plan.

## 2 DESCRIPTION OF THE GSP ACTION PLANS

The GSP action framework is based on 5 Pillars:

- Pillar 1:** Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity.
- Pillar 2:** Encourage investment, technical cooperation, policy, education, awareness and extension in soils.
- Pillar 3:** Promote targeted soil research and development, focusing on identified gaps, priorities, and synergies with related productive, environmental and social development actions.
- Pillar 4:** Enhance the quantity, quality and availability of soil data and information: data collection (generation), analysis, validation, modelling, reporting, monitoring and integration with other disciplines.
- Pillar 5:** Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources.

For each Pillar, a global plan of action was prepared and adopted by all GSP focal points and members. These plans contain specific recommendations, which form the framework for implementation. Global level and regional level implementation plans are the basis to realize these recommendations. The key principle of the GSP and its regional soil partnerships is the country-driven, bottom-up approach. Implementation of individual activities is expected at national, regional and institutional levels, based on voluntary contributions, and funding provided by donors through the Healthy Soils Facility. The implementation structure builds on Pillar-related working groups, consisting of experts mandated by their governments/organizations. Ideally, these members are able to allocate in-kind support in order to implement.

## 3 THE STRATEGIC APPROACH AND GOVERNANCE

The implementation of the Pillars for Europe needs to build on, and further develop, European networks, partner involvement and soil-related information. As orientation, the soil threats as mentioned in the European Soil Thematic Strategy are used here as the basic approach. Indicators, data sets, and working groups with EU member countries were established for various threats or groups of threats (e.g. contamination, soil sealing), and are considered in this implementation plan for Europe.

### 3.1 Soil threats in Europe

The **main priorities** for the European region have been identified mainly by the 2012 Commission [report](#) on the implementation of the Soil Thematic Strategy (STS) and ongoing activities and were repeated by the ITPS Status of World's Soil Resources [Report](#) 2015 (SWSR 2015). According to the SWSR, the main problems in Europe (including Eurasia) are soil sealing, salinization and contamination. Additional threats (in both EU 2012 and SWSRR 2015 reports) include: organic carbon changes, nutrient imbalance, soil compaction, soil erosion by wind or water, loss of soil biodiversity, desertification, landslides. Depending on regional conditions, different threats dominate.

The recent Status of the Environment Report (SOER) (EEA 2015) stresses the importance of soils for ecosystem services. It is "currently not possible to describe trends in soil functions, while some baseline data are available at pan-European level". The key function of soil is biomass production and organic matter decomposition. This is threatened by land take and inappropriate management. The regulating service of soil organic carbon is endangered by erosion and intensive land management.

The maintenance and restoration of healthy soils and proper soil functioning is an underlying principle of several targets of the Sustainable Development Goals (<https://sustainabledevelopment.un.org/sdgs>). Achieving these goals for soil in the European region requires improved sharing of data and knowledge, incentives for research and monitoring, and the careful analysis and design of adequate management options and political and economic incentives. The ESP is an opportunity to generate new stimulus, cooperation and solutions to improve focus on soils by all societal actors. It also prioritizes an understanding of cross-border soil-related and land-based demands referring to soils by the implementation of the SDGs.

### 3.2 ESP goals and objectives

The overall **goals** of the ESP are to:

- To support governmental and other actions in the context of the five Pillars: soil management, promotion of soil-related knowledge and awareness, soil research and soil information and harmonization
- To promote sustainable soil management (SSM), maintain soil functions and support efforts to reverse soil degradation in Europe
- To improve the networking between existing networks and initiatives on soil, and fill gaps

These goals have provided the framework for the following ESP **objectives**, which are then translated further into action along the five Pillars of the Global Soil Partnership (see also ESP Terms of Reference 2016). These objectives are:

- To ensure a functional ESP and collaboration with existing soil networks
- To foster collaboration between different soil stakeholders through improved communication and better understanding of soil issues

- To promote best practices in SSM
- To highlight pressures on soil functions
- To contribute to national or international reports on soil resources

### 3.3 ESP target outputs for 2017-2020

These objectives are served by the work of Working Groups (WG) for the five pillars and should lead to a number of **target outputs**:

- Establish a functioning, dynamic and representative soil network, which involves and promotes existing networks, and fills gaps where needed;
- Develop technical guidelines to implement the Voluntary Guidelines for Sustainable Soil Management (VGSSM) under European conditions according to land use, highlighting soil degradation pressures;
- Develop the European regional chapter for the next Status of the World’s Soil Resources Report (SWSR 2020);
- EUROSIL 2020: presentation of report/wrap-up/review of the ESP activities;
- Support initiatives stimulating and strengthening soil research and innovation programmes and development at the relevant levels (inter-/national, partnering schemes)
- Revise the European Soil Atlas; improve public awareness and promote resource mobilization;
- Develop policy documents on European trans-border cooperation and information exchange about SSM activities.

### 3.4 ESP sub-regional soil partnerships

Europe encompasses a large array of climatic/pedo-climatic regions and subregions as well as many countries or regions with various local approaches and cultural specificities. Therefore, there is the need for the establishment of sub-regional soil partnerships addressing these specificities.

The Eurasian Sub-Regional Soil Partnership is already well established and operational.

In addition, due to region-specific or political conditions in Europe, regional initiatives and projects are welcome and supported by the ESP, e.g. the Alpine and Mediterranean sub regions, EU28.

### 3.5 European soil networks

The European region is characterized by a strong historical tradition of soil science research and numerous and diverse networks are active at different levels related to soils and soil management (research, investigation, monitoring, communication, awareness, etc.). In Europe many research and activities in relation to soil have been done and are being done through various EU and other projects. The approach proposed for the Implementation Plan is to build as much as possible on existing soil policy and initiatives at national and EU level within Europe, and to enhance synergies between the European Soil Partnership and the existing activities.

A benefit of the ESP could be to act as a network of networks that can federate what happens in Europe in order to achieve the goals put forward. In order to avoid the dispersion and/or the duplication of effort, the ESP should promote actively synergies with existing soil networks, initiatives and other bodies. Some important networks that could contribute are:

Network	Contact
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ECSSS	European Confederation of Soil Science Societies	Pascal Boivin (HEPIA)
ESBN	European Soil Bureau Network	Allan Lilly (ESBN Chair)
ENSA	European Network on Soil Awareness	Working Group of ESBN
ELSA	European Land and Soil Alliance	Christian Steiner (ELSA Chair)
EIONET NRC Soil	European Environment Information and Observation Network - NRC Soil	Marc Van Liedekerke / Andrus Meiner
ESSC	European Society for Soil Conservation	Carmelo Dazzi (ESSC President)
DG ENV Soil Expert Group	DG ENV Soil Expert Group	Josiane Masson (E.C., DG Environment)
COMMON FORUM	Common Forum on Contaminated Land	Dominique Darmendrail (C. F. Secretariat)
EGU-SSS	EGU - Division on Soil System Sciences	Saskia Keesstra (EGU-SSS President)
ECPA	European Crop Protection Association	Eric Dereudre (ECPA President)
IUSS	The International Union of Soil Sciences	Rattan Lal (IUSS President)
FESSS	Federation of Eurasian Soil Science Societies	Sergei SHOBA (FESSS President)
GSBI	Global Soil Biodiversity Initiative	Diana Wall (GSBI Chair)
ECAF	European Conservation Agriculture Federation	Gottlieb Basch (ECAF President)
WAHF	World Agricultural Heritage Foundation	Parviz Koohafkan (WAHF Chair)
WAA	World Association of Agronomists	Andrea Sisti (WAA President)
Snowman	Snowman network – Knowledge for sustainable soils	Gilles Rayé (CCDD)
BonaRes	Soil Research for the Bioeconomy	Hans-Joerg Vogel (UFZ)

### 3.6 ESP governance approach

The governance of the Implementation Plan includes the major stakeholders of ESP:

- The Partners represented by the national focal points and delegates of non-government partners, as a rule, expressing their will at Plenary Assemblies;
- The representatives of the relevant soil networks (willing to contribute)
- The GSP Secretariat, including FAO staff from regional European, sub-regional, and country offices;
- The ESP leadership: Chair, Vice-Chair, Steering Committee, the ESP Secretariat;
- The members of the Working Groups (WGs) for the Pillars of Action.

The Implementation Plan is jointly prepared by the ESP Steering Committee and the Pillar-related WGs, revised by the GSP Secretariat and, revised and adopted by the Partners at the ESP Plenary Assembly.

For each Pillar, the Chair of the corresponding Working Group, in collaboration with the members of the WG, draws up a set of activities that contribute to the ESP objectives and envisaged outputs, incorporating concrete outputs, the timeline for the period 2017-2020, and where possible budget

and/or funding information. The WG Chair checks regularly with the executing members on the state of the planned activities and reports to the SC and ESP Plenary.

This Implementation Plan is based on previous meetings of the ESP plenary and the ESP steering committee in 2014, 2015 and 2016, and the newly identified 2016 goals and outputs. Some of the activities could also be related to recommendations put forward in the GSP Action Plans for the five pillars.

## 4 IMPLEMENTATION PLAN FOR THE ESP

The ESP is based on a voluntary commitment of all ESP members<sup>1</sup>. Support to implementation is particularly sought through the ESP national focal points. It is very challenging to develop and establish the ESP as an umbrella network that intends to align activities of existing European networks and other parties within a strategic framework related to soil management and protection. In order to achieve its objectives, the ESP should develop a global plan of information and communication with ‘clear messages’ of what it wants to achieve and what would be expected from people/organizations that want to engage.

	Recommendation	Description of outputs	partners	timeline	Budget and funding
1	Ensure a functional and active ESP through information and communication; increase the number of active members and Focal Points	<ul style="list-style-type: none"> <li>- ESP webpage (ESDAC)</li> <li>- Promote ESP through conferences, social and other media, etc.</li> </ul>	<ul style="list-style-type: none"> <li>ESP Secretariat (JRC);</li> <li>ESP Steering Committee</li> </ul>	continuous	in-kind
2	Develop an European network of networks	<ul style="list-style-type: none"> <li>- Mapping relevant projects, European soil institutions, networks and organizations in the context of the pillars</li> <li>- Organize a meeting with existing soil networks</li> <li>- Develop modalities of cooperation with sub-regional or local initiatives and activities (Alpine, Mediterranean region)</li> </ul>	SC and ESP Secretariat	continuous	in-kind
3	Report on ESP activities	<ul style="list-style-type: none"> <li>- EUROSIL 2020</li> <li>- Contribution to the SWSR2020</li> </ul>		2020	In-kind

<sup>1</sup> ESP members are public and private institutions from Europe, which are registered members of the Global Soil Partnership



## 5 IMPLEMENTATION PLAN FOR PILLAR 1

**Pillar 1:** Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity.

Chair of the Working Group for Pillar 1: Violette Geissen (University of Wageningen NL)

### 5.1 Background Pillar 1

Attention to sustainable soil management (SSM) has been promoted through the World Soil Charter and the recently endorsed Voluntary Guidelines for Sustainable Soil Management (VGSSM). The global Plan of Action for Pillar 1 provides for main reasons why SSM shall be promoted.

The global Plan of Action for Pillar 1 provides the following recommendation for implementation:

Recommendation 1: Appropriate sustainable soil management practices and systems should be identified for all land uses at regional and national levels (...) and be implemented at appropriate scales (...).

Recommendation 2: (...), sustainable agricultural production should be supported by balanced soil fertility management (...).

Recommendation 3: All barriers preventing the implementation or adoption of sustainable soil management practices and systems should be assessed and policy and technical solutions proposed (...).

Recommendation 4: A monitoring system should be developed to measure the progress of implementation of sustainable soil management practices and systems.

Recommendation 5: The GSP should facilitate the development of a capacity building strategy (...).

Recommendation 4 is directly linked to Pillar 4 and 5. Under Pillar 4, a global soil information system is built, which is based on national systems to measure and describe soil properties. Pillar 5 provides the tools so that appropriate national information becomes comparable internationally.

A significant recent development of the Global Soil Partnership is the adoption of the Voluntary Guidelines for Sustainable management (VGSSM) by the FAO member countries. It provides the framework for developing and applying management practices to prevent soil degradation from soil threats.

### 5.2 History of the ESP Pillar 1 implementation plan

This implementation plan follows on an ESP Plan of Action (PoA) for Pillar 1. That plan was initiated during the First Plenary Assembly of the ESP held in Ispra (Italy), May 21-23 2014. A working group, chaired by J. Sobocka (Slovakia), has analysed the global Pillar 1 recommendations, bringing it into European context. The ESP PoA was endorsed by the ESP Plenary in 2015, and identifies the following areas of action:

- **Develop a consistent plan of actions covering sustainable soil management practices**, knowledge and adoption, ecosystem services provision, as well as required policy and institutional support.

- **Identify the main areas for action towards sustainable soil management** through a process encompassing the main challenges and priorities (such as the threats imposed by contamination on sustainable soil management) in European countries and areas.
- **Promote better coordination of existing work on sustainable soil management** and initiate new activities via mobilisation of resources and effective partnerships.
- Consider the different ground-level user needs in terms of sustainable soil management across all scales, including support in addressing major soil management problems; and put mechanisms in place for **farmer-driven participatory action research**;
- **Address all land uses** in the different areas of Europe;
- **Consider socio-cultural aspects of sustainable soil management**, including family and youth participation.
- **Establish a supporting social, financial and regulatory political framework** to ensure that land users have access to appropriate inputs, knowledge, research, finance and planning capacity.
- **Promote the conservation** of soil resources **and the restoration/rehabilitation** of soil functions in degraded soils.

Two additional areas of action are added here:

*i) Develop mechanisms to support indicators and targets for the SDG implementation in Europe and ii) Gain a better understanding of soil as natural capital and the competing demands put on soil-based ecosystem services. Address specifically soil contamination (diffuse and contaminated sites) as a major European threat.*

### 5.3 Detailed tasks and implementation plan

	Recommendation	Description of outputs	Partners	timeline	Budget and funding
1	Appropriate sustainable soil management practices and systems should be identified for all land uses at regional and national levels using existing knowledge, adapted according to site characteristics and land user needs, taking cost-benefit analyses and social impacts into account. These practices and systems should be implemented at appropriate levels to restore and maintain soil functions and	<p>- <b>Identification of existing networks of stakeholders and existing/past projects related to sustainable soil management</b> in the different regions of Europe prone to the different soil threats (building on FP7 projects such as DESIRE and Recare, HORIZON 2020 projects such as LANDMARK, SoilCare and iSQAPER, and national projects).</p> <p>- <b>Identification of SSM practices</b> adapted to specific soil threats all over Europe and implemented in national contexts (building on same projects as above).</p>	<p>In partnership with existing SSM-related Projects and networks, and/or engaging farmer associations; national focal points provide contacts to national projects</p> <p>JRC (soil threat map, where possible, maps should come from partners/countries)</p>	start May 2017	in-kind

	ecosystem services in Europe across multiple scales.	<p>Outcome 1: an <b>integrated map on European scale overlaying soil threats</b> and existing SSMs and stakeholder networks.</p> <p>Outcome2: <b>establishment of a SSM network(s) with stakeholders and soil scientists</b> involved in past projects, farmers or other organizations involved in SSM.</p>			
2	In light of the primary importance of food security, sustainable agricultural production should be supported by <b>balanced soil fertility management using a range of cropping practices</b> , organic materials/fertilizers, weed and integrated pest management practices, and appropriate other management practices without causing other negative environmental impacts.	<p>- Improve the dialogue between industry, farmers, research and policy makers on sustainable management of fertilisers and pesticides – <b>organisation of a conference</b> bringing together those stakeholders. Make Video of the main outcomes of this conference available on YouTube (See also Pillar 2).</p> <p>- Organize <b>farm visits</b> with the SSM network dedicated to groups of farmers at regional levels, accompanied by policy makers.</p>	<p>Could be organised in partnership with iSQAPER, SoilCare or Landmark</p> <p>In partnership with existing networks (e.g. No-till)</p>	To be discussed with ESP members (will follow recommendation 1)	in-kind
3	All barriers preventing the implementation or adoption of sustainable soil management practices and systems should be evaluated and <b>policy and technical solutions should be proposed</b> to create an appropriate environment for sustainable soil management.	<p>- <b>Report on the barriers preventing SSM application</b> and on the recommended SSM practices at European and national levels (technical solutions)</p> <p>- <b>Promotion of the VGSSM to European and national context</b></p> <p>-Dissemination of those Guidelines (workshops, presentations...)</p>	JRC, EC, WU, national focal points provide information from national projects and extension services and farmer associations	2018+	Tbd
4	A cost-effective and state of the art <b>monitoring system</b> should be developed to measure the evolution of soil quality in the long term and to assess the results of implementation of	<p>Pillar 4 foresees the building of a soil monitoring system as part of the Global Soil Information System and SoilSTAT.</p> <p>Pillar 1 needs to state the requirements to build such a system</p> <p>- Monitor the effects of</p>	Pillar 1 WG reviews Pillar 4 concept and specifies	tbd	in-kind

	sustainable soil management practices and systems in different areas of Europe.	management change (indicator selection and resolution of soil monitoring) - Knowledge of already established systems (e.g. under CAP, SOC measurements, land parcel identification system, agricultural statistics, EU and non-EU)			
5	The ESP should facilitate the development of a <b>capacity building strategy</b> amongst all stakeholders to promote an integrated approach for the adoption of sustainable soil management goals in Europe	- Summer Schools should be reactivated Voluntary certification on SSM could be set up- Training on SSM could be embedded in an education programme (secondary, university level) - Pilot projects could be set up based on partnerships with universities/agriculture schools	JRC (lead) and partners	tbd	Tbd
7 new	Improve attention to soil pollution / contamination in the SSM	- Develop a plan to better tackle soil pollution and soil management in SSM best practices	interested partners	2017+	in-kind

## 6 IMPLEMENTATION PLAN FOR PILLAR 2

**Pillar 2:** Encourage investment, technical cooperation, policy, education awareness and extension in soils.

Chair of the Working Group for Pillar 2: Arwyn Jones (European Commission JRC)

Pillar 2 of the GSP underpins many of the actions under the other Pillars by addressing the general lack of societal awareness of the importance of soil in people’s lives and the well-being of the planet. In many cases, deficiency in education is the specific underlying cause of unsustainable land management practices, of the general lack of investment (both in education and physical measures to protect soil) and, as importantly, of the widespread political reluctance to adopt short- and long-term measures to preserve and enhance soil conditions. The GSP PoA for Pillar 2 consists of six interlinked and interdependent components: policy, investment, education, extension, public awareness and technical cooperation.

Pillar 4 of the EU STS: a number of activities have been organised by the European Commission and the Member States. The European Commission has organised several public events dedicated to soil, including major conferences on soil, climate change and biodiversity, contributions to meetings on the Convention on Biological Diversity, and several talks at Green Week. Moreover, leaflets and brochures have been made available in a number of EU languages<sup>2</sup>. The Commission has also published a number of soil atlases, including the *Soil Atlas of Europe* and the *European Atlas of Soil Biodiversity*. It has also

<sup>2</sup> More information at [http://ec.europa.eu/environment/soil/index\\_en.htm](http://ec.europa.eu/environment/soil/index_en.htm)

established a working group on Awareness Raising and Education in the context of the European Soil Bureau Network (ESBN)<sup>3</sup>.

The Strategy has acted as an important driver for numerous soil awareness raising tools and networks that have been developed in Member States, including the European Network for Soil Awareness (ENSA).

Moreover in 2015 the European Commission and the Member States have been particularly active in the context of the International Year of Soils (IYS) with more than 400 events organised at EU, national and local level<sup>4</sup>. The European Commission contributed to the IYS with the participation to many conferences and the organization of several events on soil during the EU Green Week, EXPO 2015 and for closing the IYS.

The IYS (together with the COP-21 and the adoption of SDGs) created a new momentum on soil at international level and it is very important to continue to build on that.

	Recommendation	Description of outputs	partners	timeline	Budget and funding
1	A key focus of the EU Soil Thematic Strategy is to improve the appreciation of the value and relevance of soil by all levels of civil society. The ESP will continue to expand these elements by developing strategies for communicating soil-related issues to all stakeholders through mechanisms.	Targeted educational resources (multilingual), public outreach material and events (e.g. launch of Soil Biodiversity Atlas, revision of Soil Atlas of Europe, ESOF), definition of best practices that can be applied by soil users (e.g. EUROSIL 2020), engagement with other scientific disciplines. Targeted educational materials to highlight both soil functions, soil ecosystem services and key soil degradation threats.	JRC + soil community	2017+	JRC will provide funding for Pillar 2 WG, soil atlas events, booth at EUROSIL and ESOF
2	Support to EU and national soil policy development	Policy briefings (e.g. JRC Technical Report on Soil management and climate change adaptation and mitigation), support to EU and national initiatives in the development of SDG targets and development, implementation and monitoring of soil protection/ conservation/ restoration policies	All partners	2017+	Self-funding
3	Sustainable agricultural production should be supported by balanced soil fertility management using a range of cropping practices, organic materials/fertilizers, weed and integrated	Establish an inclusive dialogue between industry, farmers, researchers and others and identify how to address soil fertility management at European level. Link this approach with the Landmark project conference	JRC and others	2017	in-kind

<sup>3</sup> [http://eussoils.jrc.ec.europa.eu/esbn/Esb\\_n\\_overview.html](http://eussoils.jrc.ec.europa.eu/esbn/Esb_n_overview.html)

<sup>4</sup> More information at [http://ec.europa.eu/environment/soil/iys2015/events\\_en.htm](http://ec.europa.eu/environment/soil/iys2015/events_en.htm)

	pest management practices, and appropriate soil management practices without causing other negative environmental impacts	on farming systems and soil functions in Brussels (10/2016).			
4	Extension services (e.g. farm advisory) should be supported to reflect the multi-functional services of soil and expanded beyond the traditional agricultural community to ensure the sustainable use of soil and to reduce degradation on a multi-sectoral level. Regional priorities need to be determined in terms of the disparities in the agricultural extension knowledge-base.	Improved engagement between soil science community and extension services to enhance the soil component in land use advice. Mechanism to ensure dissemination of relevant scientific developments and outreach material to support SSM and expanded knowledge base (link to Pillar 1).	National focus  National focus		
5	Scientific and technical cooperation should be promoted and strengthened.	Integrated research calls (targeting of EU and national funding programmes); Consider the results of the H2020 INSPIRATION project and research partnering instruments in Europe (e.g. FACC-JPI)  recommendations for better funding of soil-related research and best practice development (such as LIFE+, regional and H2020 programme projects)	EC and all		
6	To foster investments in soils and demonstrate positive return from investments (should reflect EU, national and regional priorities.	Evidence based success stories	All		

## 7 IMPLEMENTATION PLAN FOR PILLAR 3

**Pillar 3:** Promote targeted soil research and best SSM practice development focusing on identified gaps and priorities and synergies with related productive, environmental and social development actions.

Chair of the Working Group for Pillar 3: Coen Ritsema (University of Wageningen, NL)

## 7.1 Background Pillar 3

The Plan of Action of Pillar 3, adopted at the Third Plenary Assembly of GSP in June 2015, focuses on addressing four main recommendations suggested to facilitate interactions between the scientific community engaged in conducting basic and applicable R&D on soils, and end-user communities including decision makers to boost impact through adaptation and dissemination of the knowledge and technologies developed.

These recommendations are streamlined in WG3, and a revised list is elaborated for implementation in the upcoming period till 2020.

Recommendation 1: Review and promote targeted soil research.

Recommendation 2: Highlight benefits of soil research to environment and society.

Recommendation 3: Highlight the profitability of soil research investment.

Recommendation 4: Soil research internet platform.

Recommendation 5: Promotion of ESP through dissemination of research results.

## 7.2 Implementation structure and participation

The ESP forms a working group of interested ESP members. The working group will engage with relevant research networks in order to promote soil research in Europe and to make it visible and supportive to other regional soil partnerships across the globe.

## 7.3 Europe-specific additional Pillar 3 elements

Since the adoption of the EU STS many research and innovation projects have been funded under the Seventh Framework Programme for Research<sup>5</sup> and LIFE to address soil issues and to improve the knowledge base for action. LIFE<sup>6</sup> has funded 147 soil-related projects covering different aspects of soil protection (soil sealing, soil biodiversity, soil carbon capture, soil monitoring, water and soil, sustainable agriculture and land contamination). This effort should continue under Horizon 2020<sup>7</sup> and LIFE+ projects. The European Innovation Partnership (EIP) on Agriculture also plays a role in this context, in particular the focus groups on "Soil Organic Matter content in Mediterranean regions"<sup>8</sup> and "IPM (Integrated Pest Management) practices for soil-borne diseases"<sup>9</sup>.

Of course, research efforts at European and national level are conditional to the importance given to soil and soil protection knowledge. Research on soil organic carbon will benefit from the high priority of climate change research, boosted by COP-21 and the '4p1000 initiative' launched by France in 2015. In light of recent discussions on research priorities at European level it seems that crosscutting themes

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<sup>5</sup> [http://cordis.europa.eu/fp7/projects\\_en.html](http://cordis.europa.eu/fp7/projects_en.html)

<sup>6</sup> See <http://ec.europa.eu/environment/soil/pdf/LIFE%20and%20Soil%20protection.pdf>

<sup>7</sup> See e.g. call SC5-8-2014: Preparing and promoting innovation procurement for soil decontamination in Horizon 2020 Work Programme 2014-2015 ([http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014\\_2015/main/h2020-wp1415-climate\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-climate_en.pdf))

<sup>8</sup> <https://ec.europa.eu/eip/agriculture/en/content/soil-organic-matter-content-mediterranean-regions>

<sup>9</sup> <https://ec.europa.eu/eip/agriculture/en/content/ipm-practices-soil-borne-diseases-suppression-vegetables-and-arable-crops>

linking soil, climate change and food security or soil and water nexus have more potential than soil research alone. It should not minimise the need to improve knowledge on soil ecosystem services and economics of soil and land degradation and protection.

Another important knowledge provider at European level is the European Soil Data Centre (ESDAC)<sup>10</sup> hosted by the Joint Research Centre (JRC) of the European Commission. Another source of data is LUCAS, a survey on land cover, land use and agro-environmental indicators<sup>11</sup>. In the 2009 and 2012 surveys, a specific soil module has been integrated in order to provide statistics and indicators. The soil module was part again of the LUCAS 2015 survey which will make possible to compare land use and soil changes for ca. 25,000 points. This could be a starting point for harmonised European monitoring of soil parameters for a whole range of statistical, research and policy purposes.

The European Environmental Agency and the EIONET network are also important data and knowledge providers on soil. Recently an EIONET Working Group on Soil Contamination has been set up to reflect on the soil contamination indicators and the improvement of contamination sites inventory at EU level.

The BIOSOIL project, launched in the context of the Forest Focus Regulation<sup>12</sup>, has reported an increase in organic carbon in some European forest soils.

A lot of information also exists at national level; one of the objectives of the inventory of soil policy launched by the European Commission was to collect information on existing knowledge base and monitoring systems at national and EU level.

#### 7.4 Detailed tasks and implementation plan

Recommendation	Description of outputs	Partners	timeline	Budget lining	
1	Review and promote targeted soil research	a) Review prioritized soil research agenda for Europe to advance the state of knowledge in a.o. the field of soil characterization, dynamic soil processes, soil quality assessment, soil management, soil improvement, and provision of ecosystem services. Outputs of the INSPIRATION cooperative assessment is taken as a basis for this review. b) Review the needs of the ESP five ESP Pillars in terms of inter- and transdisciplinary research for ensuring creation of linkages, fine-tuning, synergy, integration, and coherent action, by building on existing knowledge banks (eg. European joint programming on soil as proposed by FACCE).	WG 3 members	2017-2018	volunteer /contractor (50 k€)
2	Highlight benefits of soil research to environment and society.	Assessing the feasibility of implementation of strategic research and innovation roadmaps in relation to agendas of end-user communities	WG 3 members in cooperation with donor	2017-2020	volunteer /contractor (40 k€)

<sup>10</sup> <http://esdac.jrc.ec.europa.eu/>

<sup>11</sup> Decision No 1578/2007/EC.

<sup>12</sup> Regulation (EC) No 2152/2003.



		to effectively embed soil research priorities across global, European and national levels.	organizations		
3	Highlight the profitability of soil research investment.	Evaluate the return (impact /cost-benefit) of investment in soil research, stressing the cross-cutting role of soils in grand environmental and societal challenges, and the importance of soil properties, functions and provision of ecosystem services thereupon.	WG3 members	<i>RESCHEDULED FOR NEXT TERM (beyond 2020)</i>	volunteer /contractor (100 k€)
4	Soil research internet platform	Initiate a web-based platform for a structured inventory of soil research partners, facilities, infrastructures, soil research programs and metadata on available soil information across Europe. ESP investigate the cooperation with BonaRes or similar initiatives for developing this platform.	BonaRes Portal management.  WG 3 members (or voluntary contributor)  WG3 members develop contract specifications.	2017-2020	In-kind volunteer /contractor (150,000 €)
5.	Promotion of ESP through dissemination of research results.	Promotion of the European Soil Partnership programme, specifically the one of Pillar 3, across different events and audiences using a range of dedicated means.	All ESP members	2017-2020	volunteer /contractor (40 k€)

## 8 IMPLEMENTATION PLAN FOR PILLAR 4

**Pillar 4:** Enhance the quantity and quality, and availability of soil data and information: data collection (generation), analysis, validation, modelling and processing, reporting, monitoring and integration with other disciplines.

Chair of the Working Group for Pillar 4: Edoardo Constantini (CREA Agricoltura e Ambiente, IT)

### 8.1 Background Pillar 4

Pillar 4 (soil information and data) and Pillar 5 (Harmonization of methods and measurements) both promote the building of soil information systems. The global Pillar 4 Implementation Plan (P4IP) provides practical information about the components of such systems, in particular at global level. The key principle is the sharing of soil data through web services, based on national soil data infrastructures (where available) and including soil research data infrastructures (see Pillar 3). Pillar 4 will be implemented by working group members and any other institution willing to voluntarily share soil data according to GSP specifications.

In Europe, the building of information systems as well as harmonization (Pillar 5) has a long history in terms of data exchange and networking. However, the available soil data still have many gaps, are not sufficiently resolved, and do not satisfy certain user requirements (e.g. soil monitoring for agricultural monitoring). Pillar 4 is especially challenging because data demands increase with increasing policy demands (e.g. climate change adaptation, greening in agricultural policies), but also through opportunities created by the improved availability of other spatial environmental data sets (climate, land cover).

Current assessments of the status of the European soil resources are mainly based on coarse estimates using data that were compiled during the 90ies. At the same time, the data demands in the context of climate change (e.g. greenhouse gas inventories), Sustainable Development Goals (SDG), soil monitoring and soil research are high, hindering advances in policy development and implementation, as well as research and innovation. The successful implementation of Pillar 4 depends on national/regional soil data being made accessible and, to a certain extent, harmonized at European and global levels.

The global Pillar 4 Plan of Action contains the following general recommendations:

1. Build an enduring and authoritative system for monitoring and forecasting the condition of the Earth's soil resources (...) to meet international and regional information needs
2. Pillar 4 should build on national and within-country systems through a collaborative network and the distributed design
3. Integrate the global soil information system into the much larger effort to build and maintain the Global Earth Observing System of Systems (GEOSS)
4. The global soil information system should include a training program (...)

The plan then further identifies data products:

- a) Soil monitoring and indicators (SoilSTAT): *among others, this task may consider the monitoring needs by Pillar 1 (sustainable soil management), and combine national efforts for indicator reporting (SDG, FAOSTATs, etc.)*
- b) soil profile/point data

- Comprehensive soil profile and analytical database – Tier 1
- World reference soil profile and analytical database – Tier 2
- c) national soil type maps 1:1 000,000 to develop an improved global polygon coverage
- d) soil property maps (grids)
  - Improve the Harmonized World Soil Database (*already implemented*)
  - Coarse- (1 km) and fine-resolution (100 m) grids of soil properties

The latter coarse soil grid involves the current initiative on soil carbon mapping (1km, 0-30 cm, soil carbon stocks). Details of this campaign are provided through guidelines ([www.fao.org/3/a-bp164e.pdf](http://www.fao.org/3/a-bp164e.pdf)), which contains detailed background, methods and specifications (definitions).

Detailed definitions about the above-mentioned data can be found in the global-level implementation plan ([www.fao.org/3/a-bl102e.pdf](http://www.fao.org/3/a-bl102e.pdf)). This plan is followed by detailed specifications, which allow the development and sharing of national data products. These specifications will be developed by the global-level Pillar 4 Working Group. As for ESP, the global specifications may be valid as well, but could also require some modifications, which are region-specific.

## 8.2 Implementation structure and participation

The implementation of this Pillar requires specialized institutions and other experts to support and participate in the development and dissemination of the defined data products. At global level, the International Network of Soil Information Institutions (INSII) has been established as the core implementing network and the European system will mirror and expand this structure. ESP-INSII are thus the European INSII institutions.

Building INSII requires nominations of national institutions by the national focal points or other official governmental bodies. For example, this could be institutions hosting the national soil information systems, and/or distributing national soil data following INSPIRE or other accepted standards.

At European level, two networks exist:

- a) European Soil Bureau Network: experts were invited by JRC to compile the European Soil Geographical Data Base: selection is based on expertise; currently this network is not active
- b) National Reference Centres Soil of the European Information and Observation Network (EIONET): this is an official network of the European Environment Agency (EEA), created by national governmental contact points.

For some of the Pillar 4 tasks (and also Pillar 5 tasks – see section 9), e.g. soil monitoring, the EIONET National Reference Centres for Soil (NRC Soil) bundle core competencies.

The International Network of Soil Information Institutions (INSII) comprises mandated national soil information institutions. At global level, INSII is supported by a global Pillar 4 working group (P4WG), which mainly consists of the chairs of the Pillar working groups in the regional soil partnerships. Another supporting institution at global level is the GSP Soil Data Facility (SDF). Also at the level of regional soil partnerships, the supporting role of regional data centres has been recognized. It may be advisable for the ESP Pillar 4 to rely also on the activities of existing soil data centres:

- European Soil Data Centre (ESDAC),
- European Topic Centre on Urban, Land and Soils (ETC ULS).

Similar to the global P4WG, the European INSII members (ESP-INSII) may discuss and decide to build a coordination team (ESP-P4WG), similar to the steering committee of the European Soil Bureau Network (ESBN). ESP-INSII may also discuss as to which extent it will cover aspects related to Pillar 5. This would

save the building of another network with competencies similar and in some cases identical to INSII institutions.

### 8.3 Europe-specific additional Pillar 4 elements

Europe has a relative good record in many aspects of soil data collation and dissemination. However, soil information in Europe, for example as shared through INSPIRE, is patchy and not comparable. The European soil information system stagnates, and countries do not share their soil monitoring data. Therefore, mechanisms need to be put in place to encourage data sharing, minimise infringements of data sovereignty and protect intellectual property. Building a network of data providers that trust each other and have mutual respect will be important.

### 8.4 European soil data infrastructure - INSPIRE

Member countries of the EU endorsed the INSPIRE Directive to build a European infrastructure for environmental spatial data sets, using web services. This infrastructure design is identical to the distributed system, envisaged by the global soil information system. Each country will distribute their own data sets according to INSPIRE rules. This means that countries, which follow INSPIRE, already now build a national soil data infrastructure, which can be used for the exchange of the above-mentioned GSP soil data products.

Despite defined use cases, the INSPIRE Directive does not specify certain national data sets, but potentially allows the mapping and exchange of all Pillar 4 data sets (incl. data which implement Pillar 5 indicator sets). In practice, national activities to implement INSPIRE are hardly coordinated, and data are not harmonized across Europe

It has to be noted that the INSPIRE system builds on standards, such as by the Open Geospatial Consortium (OGC) and the International Standardization Organization (ISO). These standards are common in Web-GIS, and are common to all data infrastructures and web-GIS software, independent of the INSPIRE Directive for Europe, thus valid to any country. Following guidance from existing global standards, a soil information model will be developed under Pillar 5, which will use ISO 28258 SoilML, and which will follow OGC recommendations. It is a requirement, that this model will be conform to the INSPIRE specifications.

### 8.5 Detailed tasks and implementation plan

Recommendation/Action	Description of outputs	partners	timeline	Budget and funding
1 European INSII members	- Joint technical meeting of European INSII members and other soil information institutions to discuss ESP-related Pillar 4 and Pillar 5 tasks -	ESP INSII/ NRC Soil, ETC ULS, ESBN, ESDAC	01/2018	In-kind
2 Soil monitoring system - to measure the evolution of	- Conduct a design study (integrating national and Europe-wide approaches (JRC, EUROSTAT)); building on the FP6 ENVASSO project and EEA studies - Tier 1 monitoring as a baseline: using existing national data (e.g. consider links to ICP Forests Level	ESP-P4WG EIONET- NRC Soil	2017 (design) Tier 1: 2018 Tier 2: tbd	€ 50,000 (design study) Tier 1: in-kind Tier 2: tbd

	soil quality/soil threats - success control of SSM	I and II and EUROSTAT/JRC LUCAS Soil) - Tier 2: to fill gaps of the above; extend parameters, harmonize, increase resolution, involve remote sensing, etc. - Use and - if necessary - expand the European EIONET indicator system (see also Pillar 5) - Establish soil monitoring in Europe - Derive soil statistics/indicators for EUROSTAT and P4 SoilSTAT - Deliver data for SOER 2020 and for the European chapter of the Status of the World's Soil Resources Report 2020 - Mobilize significant resources for Tier 2			
3	Comprehensive soil profile and analytical database	The global specifications for soil profile data will be very broad, enabling a maximum of soil profile data to be made available. ESDAC will compile, collect and distribute the shared data if national policies allow for such a European repository.	ESP-INSII; ESDAC	Provisional timeline: end 2018	in kind
4	World reference soil profile and analytical database	An incomplete European database of soil profiles already exists and is held by JRC (SPADE); it has been built by ESNB, and still has many representativity and parameter gaps. The global P4WG specifications will be reviewed and expanded to European conditions (e.g. representativity). ESDAC will collect thus complete the European soil profile data base, using newly shared representative soil profile data. It will also distribute the data based on agreement with the data providers and owners (ESP-INSII).	ESP-INSII ESDAC	Provisional data for completion is end 2020.	in kind
5	Soil type maps	– Support global P4 task to update the digital Soil Map of the World (scale 1:1M) based on the international soil classification WRB: ESP-INSII members distribute national, interoperable 1:1Mio soil polygon maps via web services. – Conduct a design study and stakeholder consultation in conjunction with other pillars about a higher resolution soil map data base in Europe (1:250,000 coverage); build on the results of the GS Soil project and activities of the former ESNB WG250) – Mobilize resources to implement the mapping nationally, and ensure the proper specifications documents and coordination	ESP-INSII ESP-P4WG	2018/19	Global soil map: in kind Design study for European map: € 40,000
6	Coarse - resolution grids of soil	– Apply global level product specifications – Implement national soil property maps – Share using web services	ESP-INSII	GSOC: 2017 All other properties:	in kind some capacity

	properties			2018	building necessary
7	Fine-resolution grids of soil properties	as above, 100 m resolution	ESP-INSII	no time frame (see global level)	As above
8	Elaboration at European level of services that promote sharing, harmonization and use of data and information	Continue and strengthening the European coordination concerning: <ul style="list-style-type: none"> <li>– soil registry, soil vocabulary service, discovery and transformation services, European indicators,</li> <li>– coordination of harmonization activities</li> <li>– multi-linguality of view-/discovery- and download services at European level</li> </ul>	ESDAC, ETC ULS, EUROSTAT, ESP-INSII/NRC-Soil	2017-2020	in-kind

## 9 IMPLEMENTATION PLAN FOR PILLAR 5

**Pillar 5:** Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources.

Chair of the Working Group for Pillar 5: Hakki Emrah Erdogan (MoFAL, TR)

### 9.1 Background Pillar 5

While the availability of soil data and information systems is handled in [Pillar 4](#), it needs to be emphasized that this information must first be gathered in a harmonized way; otherwise, hazard assessments and other information about the status of soils cannot be shared and combined.

Within this scope, the ESP Implementation Plan (ESP-IP) for Pillar 5 involves the harmonization of terminology (soil classification and description), methods, indicators and evaluation methods and models in order to develop regional policies for sustainable management of soil resources in Europe.

Moreover, Pillar 5 aims to coordinate the European contributions to global efforts which focus on assessment and development of exchange standards for soil information, including the development of indicators and measures for monitoring the impact of relevant policy efforts to ensure European achievements, for example for the SDGs.

In the foundation of this implementation plan, the recommendations of the global plan of action for Pillar 5 (<http://www.fao.org/3/az922e>) were taken into consideration and in the following stages possible *European contribution* was conducted.

The main objective of Pillar 5 is to develop an over-arching mechanism for globally consistent and comparable harmonized soil information. This mechanism includes the following working **areas of harmonization**:

- Soil profile observation and description
- Soil classification systems
- Soil mapping and soil property estimation
- Laboratory and field analytical data of soil
- Soil information exchange

- Soil data interpretation: agreed and representative indicator sets and evaluation functions to assess the impact and performance of the policies, projects and investments on soil.

Pillar 5 harmonization is the fundament for comparable soil information, thus essential to Pillar 4, and an enabling mechanism for all other pillars providing and using soil information.

In Europe, there has been significant progress in the area of harmonization of soil information. ESDAC (hosted by JRC), for instance, could play a role as a focal point for the development of procedures and methods for data collection, quality assessment and control, data management and storage, and data distribution. Harmonized information about soils also plays an important role in the building of the European Information and Observation Network (EIONET), supported by European Topic Centres, ETCs (e.g. currently ETC on Urban, Land and Soil). The European Soil Bureau Network (ESBN) has (during 1982-2010) invested a lot of effort into the harmonization of soil information. The ETC on soil and the NRC Soil (see Pillar 4) have developed harmonized indicator frameworks related to different policies, e.g. Agri-Environmental Soil Quality Indicators and GAEC (Good agricultural and environmental condition standards for soil and water management) as part of the requirements under Cross Compliance (Common Agriculture Policy (CAP) 2003).

While there has been significant progress in the above-mentioned areas of harmonization, a number of challenges remain (see also Table 1).

*Table 1: Today's challenges to improve soil data availability and comparability in Europe*

	<b>Needs</b>	<b>Data types</b>	<b>Challenges to harmonization</b>
1	Sustainable Development Goals (SDG), Assessment of ecosystem services	European soil condition monitoring /environmental observation	Harmonization of measurements, internationally agreed indicators and soil threats,
2	Land use planning and sustainable soil management, hazard assessments	High resolution soil property maps (incl. uncertainties)	Harmonized parameters and measurements, mapping procedures, data evaluation functions
3	Soil and soil-related research	Long-term field trials, Soil data with different temporal and spatial resolutions e-Infrastructures	Cross-thematic big data; data accessibility and connectivity (interdisciplinary links between different research (and policy) areas such as biodiversity, climate change and land degradation )
4	Data policies: INSPIRE	Interoperable digital soil data	Vocabulary services, multi-linguality, comparability of the content of data products not guaranteed

## 9.2 Implementation structure and participation

The International Network of Soil Information Institutions (INSII) is being established by Global Soil Partnership in order to implement the global plan of action for Pillar 4. These institutions also combine expertise related to several areas of harmonization (soil description, soil mapping, partly soil analysis, soil evaluation and indicators).

As mentioned under Pillar 4, in Europe, several networks and centres exist, however, with stagnating achievements and country support. Various countries stopped action due to lacking commonly agreed work plans, political support and finances. Thus, this work plan will provide such a framework for action.

Within this framework, the network of international soil information institutions (INSII), as described in Pillar 4, requires some expansion and additional working groups:

- ad-hoc working group for harmonization of soil mapping (temporary assignment)
- Working Group for the harmonization of Soil Analysis (long-term)
- Working Group for the review and expansion of Soil Indicators

### 9.3 Europe-specific additional Pillar 5 elements

Similar to P4, Europe has an intensive history of harmonization activities, mainly due to JRC and EEA activities in cooperation with Europe-wide experts groups and networks. Provided the challenges listed above, including and given the stagnation of harmonization and data sharing since the late 90ies, harmonization is still a demanding area of action.

In general, the global level Pillar 5 Implementation Plan (P5IP) is also valid for the European Soil Partnership. In some areas of harmonization, further region-specific modifications are needed. Previous activities in Europe can be used as a basis (e.g. EEA indicator system).

Pillar 5 provides the opportunity to check thoroughly the importance of international activities related to harmonization, and to connect to national activities:

- INSPIRE vocabulary services for soil data
- Developments towards a Universal Soil Classifications
- Europe-wide network of soil laboratories (e.g. connected to European Union Reference Laboratories EURL)

### 9.4 Detailed tasks and implementation plan

	Recommendation / actions	Description of outputs	Partners	Timeline	Budget and Funding
1	Revision of the European soil mapping guideline (see also Pillar 4, action 5)	<ul style="list-style-type: none"> <li>– Revise the ESNB Manual of Procedures</li> <li>– Integrate options to use remote sensing and digital soil mapping (e.g. eSOTER project)</li> <li>– Refine the nested system (see GS Soil project)</li> <li>– Develop a European soil map legend (using the soil regions concept) based on WRB</li> </ul>	ESP-INSII ad-hoc WG soil mapping	end 2018	In-kind
2	Soil profile description standard	<ul style="list-style-type: none"> <li>– will be covered by the global Pillar 5 Implementation Plan (P5IP)</li> </ul>	global INSII		In-kind
3	Soil classification: WRB	<ul style="list-style-type: none"> <li>– For status as of 2012: see GS Soil</li> <li>– Improve national correlation methods</li> <li>– Document challenges and solutions</li> </ul>	ESP-INSII	2017/2020	In-kind
4	Reference laboratories	<ul style="list-style-type: none"> <li>– Establish Europe-wide network of soil laboratories building on existing initiatives (e.g. European Union Reference Laboratories EURL, ICP Forests FSEP; Network on emerging on environ. substance, §185 on Europ. Metrology (EMRP))</li> <li>– Selection and establishing a leading laboratory, which implements the web site, produces and distributes reference material, build a data base for</li> </ul>	ESP-INSII/NRC Soil, WG Soil Analysis	2018-2020	Lead laboratory: € 350,000



		calibration and QA, ring tests, evaluations and reporting – see also global P5IP			
5	Best practice soil analysis	– Interact with global level INSII P5 for developing best practice recommendations and procedures for soil sampling, storage, analysis – Liaise with ISO TC 190 and CEN	ESP-INSII/NRC Soil, WG Soil Analysis, lead laboratory	2018/2019	In-kind
6	Soil Information model	– Analyse the implementation status for interoperable soil data according to INSPIRE, and the degree of harmonization – Develop concept to address coordination needs – ESP INSII members to test the model, and to define and implement use cases – Liaising with networks according global P5IP: GODAN Soil Data WG	ESDAC and ETC ULS ESP INSII	2018	In-kind
7	Indicators	– Develop a soil indicator concept about the state and response of soils under the effect of policies, management and climate change (incl. discussion and feedback with ESP-INSII) – Build on EEA and FP6-ENVASSO indicators – Identify research needs to propose to Pillar 3 – Coordinate with global level approach (INSII)	ETC ULS and EIONET NRC Soil ESP INSII	2017/2018	In-kind
8	Evaluation methods - review	– Review of existing evaluation methods (EU-HYDI, ENVASSO, RAMSOIL, other projects): gaps, challenges, solutions – Harmonization needs and cost estimation (coordinate with Pillar 3 research, 3rd action)	ESP-INSII (WG Methods) voluntary contributions	2018	€ 50,000 (if possible in-kind)
9	Evaluation methods - WIKI	– Content-management system: formula collection, documentation, sources	voluntary contributions	2018	€ 50,000 (if possible in-kind)

## 10 GLOSSARY

EASP	Eurasian Soil Partnership
EEA	European Environment Agency
EIONET	European Information and Observation Network
ESBN	European Soil Bureau Network
ESDAC	European Soil Data Centre
ESP	Soil Partnership
ETC ULS	European Topic Centre on Urban, Land and Soils
ESP-INSII	European partners of INSII
Extension services	(in agriculture) This term refers to various activities or institutions involved in outreach and dissemination of scientific research to the field level (implementation and application). E.g. agricultural counsellors visiting the farms, discussing with farmers and giving advice on latest techniques or practices.
GSP	Global Soil Partnership
INSII	International Network of Soil Information Institutions
IP	Implementation Plan
NRC	National Reference Centre

PoA	Plan of Action
RSP	Regional Soil Partnership
SOER	Status of the Environment Report
SSM	Sustainable Soil Management
SWSRR	Status of the World's Soil Resources Report
VGSSM	Voluntary Guidelines for Sustainable Soil Management
WG	Working Group