Roadmap for the European Joint Program SOIL: Towards climate-smart sustainable management of agricultural soils

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Our Planet suffers from human activities. Especially different forms of intensive agriculture with large inputs of fertilisers, pesticides and mechanical energy increasingly add to the human-pressure on the environment. As part of the environment soils are also under threat, while they are an essential part of this system as they need to provide safe food, feed, fibre and fuel for an increasing population, and it is the basis for the bio-economy. Our challenge as scientists is to focus on the scientific research towards finding solutions for the societal issues of our time and facilitating the adoption of these solutions. For this interdisciplinary collaboration and networking is needed. It is necessary to bring scientists and stakeholders that have the same goal, work on the same societal issue, but have different (scientific) backgrounds.

The European Joint Programme (EJP) SOIL is a European network of research institutes in the field of soil science and agricultural soil management and policies. This EJP aims to boost research by finding synergies in research, avoid current fragmentation and make a leapfrog in research on good agricultural soil management in three main areas: climate change mitigation and adaptation, food security and ecosystem services delivery by joint programming, training and capacity building, whilst taking into account the need for effective policy solutions, as well as the socio-economic conditions of all stakeholders in the agricultural value chain.
The main aim of the EJP SOIL is to construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management. One important aspect of agricultural soil management to be addressed in the EJP SOIL is to strengthen the European research community on agricultural soil management, through a concerted alignment of research, training and capacity building; and co-construct with stakeholders a roadmap for agricultural soil research;

To develop a structured roadmap EJP SOIL works with a version of the knowledge management framework of Dalkir (2005). The EJP version uses four compartments: i) Knowledge development, ii) knowledge harmonisation, organisation & storage iii) knowledge sharing & transfer and iv) knowledge application. The four segments are part of a cyclic process to enhance the development and use of knowledge on agricultural soils. Knowledge development comprises of assessing new knowledge needs to achieve the expected impacts of EJP SOIL. Therefore, using stakeholder involvement, knowledge gaps across Europe will be identified to work towards adoption of Climate-Smart Sustainable Agricultural Soil Management (CSSASM). Within the knowledge sharing & transfer compartment the capacity of scientists and non-academic stakeholders will be enhanced. EJP SOIL will work towards network set ups and capacity building for different stakeholder groups. The knowledge harmonisation, organization & storage compartment of the knowledge framework ensures linkages with all stakeholders to ensure data harmonization and standardization. The last compartment, application of knowledge, will be facilitated by creating better guidelines, awareness and capacity for CSSASM adoption.

**Keywords:** Knowledge framework, climate smart agricultural soil management, Europe-wide network development