EJP SOIL

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Towards climate-smart sustainable management of agricultural soils, European Joint Programme

About

EJP SOIL is a European Joint Programme on Agricultural Soil Management addressing key societal challenges including climate change and future food supply. EJP SOIL unites a unique group of 26 partners from 24 European countries, > 400 scientists in a 5 year programme (2020 - 2025). The overall goal of the EJP SOIL programme is to build a sustainable European integrated research system and develop and deploy a reference framework on climate-smart, sustainable agricultural soil management.

Vision and aim

EJP SOIL's vision is to make soils a pivotal resource to enable a transition to a climate-smart, circular society. The long-term aspiration of EJP SOIL is to put soil science knowledge into practise for a productive, sustainable, and climate-smart stewardship of agricultural land and soil resources. To achieve this, EJP SOIL aims to change the perception of the role of farmers among the general public, scientists, and policymakers. Farmers also need to change their perceptions of the potential for climate-smart sustainable farming.

The ambition of EJP SOIL is to pool and align national resources and partner efforts to harmonize methods, indicators, databases, and models on soil across Europe.

Challenges

Soils have a large role to play in solving the problems of our time. Improved knowledge and farming practices are fundamental when addressing future challenges. The necessary actions require societal, scientific, policy, economic and educational capacities.

Soil is the habitat and the supplier of nutrients and water for plants and their roots. Fertile and productive soils are the prerequisite for a stable supply of food, fibre, animal feed, timber and other biomasses. Soils sustain huge biodiversity and contribute to the provision of a wide range of ecosystem services, and as the largest store of carbon on land, soils are also in the nexus of the global climate challenges. Soils are part of the solution to realising the SDGs.

However, soil is a limited resource, and soil degradation including erosion, loss of soil organic matter, soil contamination and soil sealing are threats to soil functions. Intensified production due to rising global demand for food and biomass will only amplify the challenges. Improved knowledge and farming practices are fundamental to address these challenges. Actions in stopping the damages are dependent on societal, scientific, policy, economic and educational capacities.

Climate change projections predict major environmental changes for Europe, which will increase the probability of erosion and landslides, and potentially increase nutrients leaching in northern areas, while exposing other Mediterranean areas to periods of drought and heat waves and increased wind erosion. These changes require European agriculture to adapt to these changes and become more resilient to extreme events.

Scope, goals and research topics

The long term expected impact of EJP SOIL is that the farming sector becomes a steward of land and soil resources in Europe and farmers contribute to the adaptation of agroecosystems to climate change and to climate change mitigation.

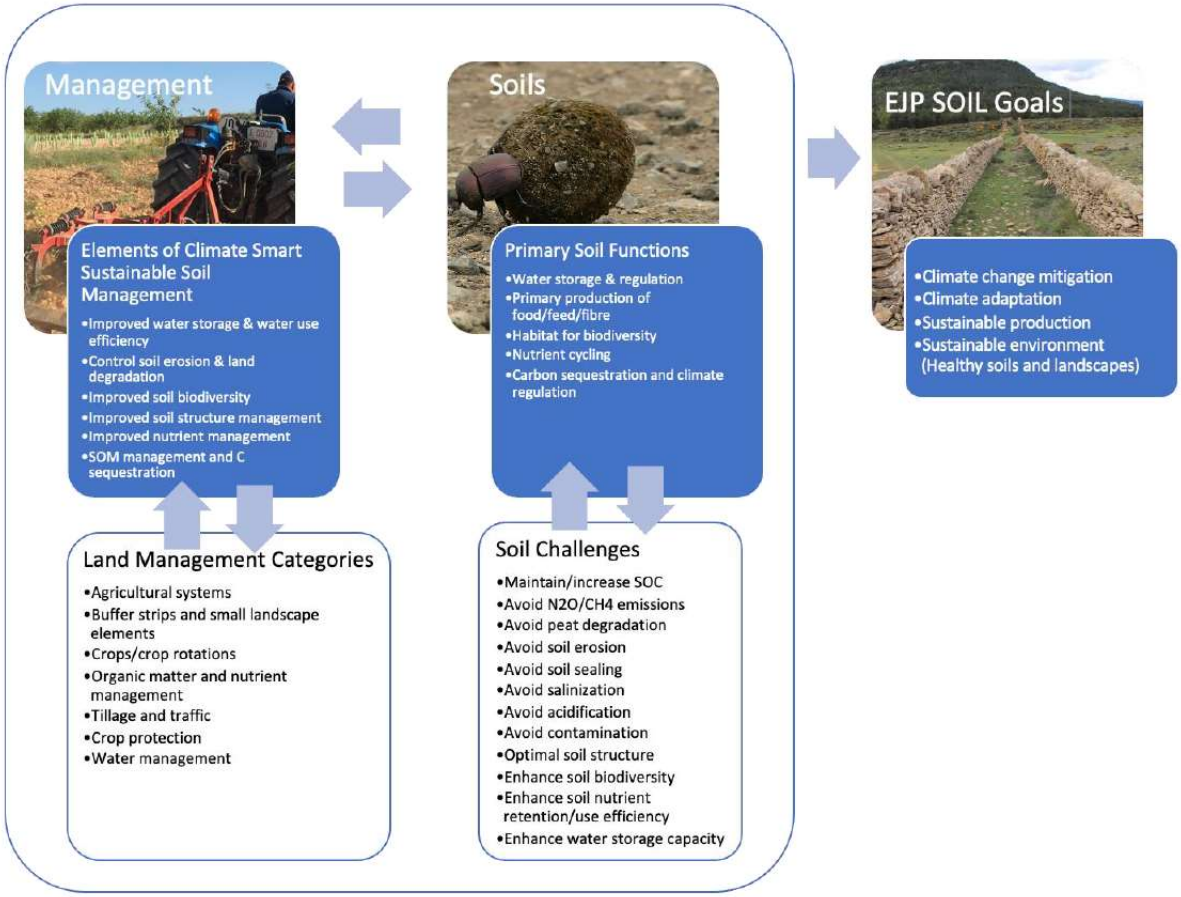
EJP SOIL will address all agricultural soils, i.e. soils under cropland (including bioenergy crops), grasslands, vineyards and orchards, agroforestry systems, hedges and marginal /degraded land, as well as urban agriculture. It will consider mineral as well as organic agricultural soils.

EJP SOIL works towards a sustainable European integrated research system on agricultural soils to develop and deploy a framework on climate-smart, sustainable agricultural soil management. The network will improve understanding of agricultural soil management by targeting:

- Climate change mitigation and adaptation
- Food security and ecosystem services
- Soil education in Europe and capacity building

The expected impact and the targets of EJP SOIL are:

1. Climate change mitigation;
   Fostering soil-carbon sequestration that contributes to climate change mitigation in agricultural soils
2. Climate change adaptation;
   Fostering understanding of soil management and its influence on climate change adaptation
3. Sustainable production;
   Fostering understanding of soil management and its influence on sustainable agricultural production and developing region-specific fertilization practices considering the local soil, water and pedoclimatic conditions.
4. Sustainable environmental management;
   Fostering understanding of soil management and its influence on a sustainably used natural environment.
5. Networking and knowledge sharing;
   Strengthening scientific cooperation at the European level including training young scientists
6. Harmonising;
   Supporting harmonized European soil information, including international reporting
7. Adoption of sustainable soil management;
   Fostering the uptake of soil management practices which are conductive to climate change adaptation and mitigation for end-users.
8. Science-policy interface;
   Fostering uptake of soil management practices conducive to climate change adaptation and mitigation for the science-policy interface



Link diagram illustrating i) how local land management choices can influence the elements defining climate-smart sustainable soil management; ii) the link between primary soil functions and soil challenges; and iii) how optimized interactions between soil functions and soil management will lead to achieving EJP SOIL Goals. *From: Roadmap for the European Joint Programme SOIL, 2021.*