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BOOK OF ABSTRACTS

Block A

Session A2

Using participatory design for developing
farmer friendly tools for soil practices and
schemes



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Session Description

Involved projects: ROAD4SCHEMES, IntoDIALOGUE, PRAC2LIV

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EJP SOIL aims to promote the use of regionally specific tools to provide either qualitative or quantitative information on agricultural soil-based ecosystem services, e.g., climate change. The trend is for more complex decision support tools (DSTs) that focus on both agricultural production and environmental services. However, the level of implementation of DSTs and guidelines for sustainable soil management in Europe varies considerably among farmers and regions. This may be partly due to different perspectives of land-users for, e.g., taking up C-farming practices and schemes as compared to monitoring bodies. Studies have identified a large variety in limiting factors for adoption of tools, including differences in advisory frameworks, country-specific data and calibration requirements, issues around language and farmers' ecological identity. Abstracts are invited to share the experiences of your projects in the end-users' involvement, as well as on the use of participatory design in the development and testing of DSTs.

Abstracts of Oral Presentations

Stakeholders mapping and engagement on socio-ecological research

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In recent scientific papers, analysing stakeholders mapping, the main described point is stakeholder engagement. It is being increasingly promoted in all kinds of research funding organizations, and indeed by many researchers themselves, as an important pathway to achieving impact. In the scientific papers, which report on issues related to environmental management and environmental policy, a clearly practice-oriented approach to stakeholder engagement is developed. In this research area, the focus is on explaining the processes through which various stakeholders can be included and acknowledged in decision-making and policy-making processes, especially related to environmental and sustainability issues. However, the gap between research results and practice is often one of the biggest problems, when a lot of effort, researchers' time and funding are invested in research, and the results obtained are not satisfactory to either the researchers or the end users. Therefore, the participation of stakeholders and the knowledge and practices they provide are important factors that reduce the gap between research results and practice and ensure the greatest efficiency in later use of research results. Various stakeholder engagement strategies could be found in the literature. The most cited way the bottom-up stakeholder engagement approach is when we identify the most relevant topic during the interview of the target group. Furthermore, they are enrolling in all phases of inquiries into solutions or problem-solving. One of the most challenging issues is to identify the end users, who will implement the research-based solutions. This is one of the main questions that the Into-DIALOGUE project, implemented under the EJP SOIL program, is trying to answer. Identifying potential users and asking them about their usage perspective at the beginning of the research is very useful, but it is still difficult to identify and communicate with potential users at the beginning of the research project. One of the possible ways – to make stakeholders map. The main benefit of a stakeholder map is to get a visual representation of all the people who can influence your project and how they are connected. The aim of Into-DIALOGUE project is to identify why the conjunction of various practices, which farmers are already selectively implementing, is complicated and slow to combine, and on a landscape or a territorial scale, to compare the experience in different countries, and find common solution how to solve the common problems for the same stakeholders. In

mentioned research the most important step is to identify our target groups, engage them and to get high qualified answers to avoid gaps between our expectations and real situation, despite the geographical and territorial differences.

Keywords: stakeholders, criterion, engagement, values and practices.

Testing FAO's "TAPE" in Norway: a participatory tool for farmers, policymakers and other stakeholders

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Keywords: TAPE, agroecology, participatory DST

In response to the need for knowledge about how different types of agricultural production systems contribute to more sustainable food systems, FAO has developed "Tool for Agroecological Performance Evaluation" (TAPE, 2019). TAPE characterizes the production system's degree of compliance with agroecological approaches and principles and then evaluates its performance against criteria considered relevant for achieving the Sustainable Development Goals. Amongst several criteria is soil health. TAPE consists of four steps, 1) contextualization of territory, 2) characterization of compliance with agroecological approaches, 3) evaluation of sustainability performance, and 4) participatory interpretation and revision of the results with stakeholders. Here, we have used TAPE to assess the sustainability of an organic dairy farm in Midwest Norway. We observed several shortcomings of using TAPE, the main issues being poor adaptation of indicators to Norway's ecological, climatic, and socio-cultural conditions. Yet, the participatory interpretation and revision of the results with stakeholders showed to be a promising framework for supporting complex decision-making processes with farmers, policymakers, and other stakeholders.

Land-users' perceptions on carbon farming and related rural landscape changes

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An extensive body of research has shown that land management practices can increase soil organic carbon stocks on agricultural lands. This knowledge has also gained interest among policy makers, and the concept of carbon farming is increasing in attention. Recently, the EU Commission published its proposal for a regulatory framework on carbon removals, in which the European Commission proposes standards for certifying carbon farming activities.

Successful carbon farming presupposes that carbon farming scheme design enables land users' to effectively implement relevant carbon farming practices. Despite these new legislative ambitions on carbon farming, key questions remain, and knowledge is needed on land-users' perceptions of strengths and weaknesses of different designs for carbon farming schemes. The carbon farming initiatives and schemes will significantly change the rural landscapes (arable land will be re-wetted, afforestation and changing farming systems). However, the perceptions of the key stakeholders and people living in rural areas are missing in this transformation. In this paper, we analyse 9 different partner countries in EU, that have conducted focus groups with landowners on carbon farming and land use changes. The paper, presents and discuss the basis for designing carbon farming schemes that are perceived as fair and effective by land-users.

Keywords: Carbon Farming; Stakeholder perceptions; Policy schemes

Does EJP SOIL have what agricultural advisors want?

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Farm advisors play a crucial role in promoting and facilitating the adoption of sustainable soil management practices. To effectively support farmers, advisors need to have access to current, practical insights and tools. EJP SOIL (Task 7.6) aims to address that need by tailoring the format and content of new knowledge and tools to the needs of advisors in different parts of Europe. Our goal is to develop practical mechanisms to put the rich results generated by EJP SOIL to use, both strengthening soil advisory capacity and contributing to Agricultural and Knowledge Innovation Systems (AKIS).

In this interactive presentation, we will share the results of our first step: understanding the current reality of advisors. We present the results of an EU-wide survey and follow-up workshop, targeting agricultural advisors and trainers in 24 countries. The survey invited respondents to share their views on current advisory practices and identify future knowledge needs and interests. In the follow-up workshop, national advisory experts were asked to discuss those themes in more detail, and explore opportunities for EJP SOIL to strengthen soil advisory capacity.

Our next step is to work together with the EJP SOIL community to find synergies. We will invite the audience to start exploring how the results/products that have been generated (or will be generated) in their projects can match the needs and interests identified by advisors. In this way we collaborate to foster sustainable soil management in practice and contribute to

one of the key EU Soil Mission objectives: building capacity and the knowledge base for soil stewardship.

Keywords: advisory practices; capacity building; knowledge dissemination; sustainable soil management

Stakeholder and end-user involvement in the formulation and evaluation of terminology for a comprehensive soil health framework

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The EJP-SOIL project SERENA aims to develop a universal framework for the determination of soil threats and ecosystem services across the European Union partner countries. A fundamental pillar of the work is the involvement of stakeholders and end-users in all steps of the project that will actively participate to the validation of the project outputs. By definition, stakeholders are those who have a stake and may be affected by a framework for soil health, have a role in its implementation or have specific experience, expertise or technical knowledge. The nature of their stake in relation to the subject will determine their level of influence or interest in the topic.

As the concept of soil health has gained priority at EU scale, it is pertinent to develop a comprehensive terminology to ensure a shared common understanding across stakeholders. Although a broad high level definition of soil health is now proposed at EU scale, it is true that different stakeholders within and between member states use the same terminology to describe different things, or different terminology to mean that same thing. This challenge occurs across stakeholders and scales.

To overcome this challenge, the SERENA project has developed a database of stakeholders who will be engaged in an effort to harmonise terminology related to soil health. The stakeholder database comprises different backgrounds regarding education, demography, age, gender, and many more characteristics which influence their opinions and answers in different communication processes. This supports the identification of persons for different ways of involvement with different temporal extent, scientific depth, network representation and many more.

In parallel, a survey has been developed and translated into national languages to revise proposed definitions that have been developed as part of SERENA. Definitions have been formulated to be precise, clear, intuitive, complete and relevant. An analysis of the results will guide insights into terminology used by different stakeholders at different scales. Outputs are anticipated to support more enhanced communication strategies that can be targeted to different stakeholder types, intended to support a transition towards healthier soils in Europe. The basic ideas and challenges to

compile the SERENA stakeholder database are presented, including practical examples of stakeholder involvement and implementation activities.

Keywords: stakeholders, soil threats, soil ecosystem services, database, targeted communication

Investigating policy pathways to enact soil-based agroecological principles in the European and Turkish farming systems

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The present study aims at investigating the different policy instruments which can currently contribute to addressing agroecological land use challenges in different context in the European Union and Turkey. Agroecological land use challenges are here meant challenges addressed at recovering degraded soils due to intensive farming with the aim to allow the development of more resilient and sustainable agricultural systems.

Three key policy areas of action are here identified: funding opportunities for farmers; supporting participatory processes; regulating land uses. Funding opportunities encompasses local funding resources addressed to promote the adoption of sustainable climate-and environment-friendly farming practices and approaches (e.g., through the so-called “green architecture” of the new Common Agriculture Policy - CAP). Supporting participatory processes encompasses a wide range of instruments involving local communities through multi-actor, multi-level and collaborative initiatives (European Innovation Partnership for Agricultural productivity and sustainability -EIP-Agri, Living Labs and Lighthouses, the LIFE Programme, the LEADER Strategic local plans, Eco-regions, Land associations, Bio districts, etc.). Regulating land uses consists of minimum requirements farmers must comply with when operating in areas with specific environmental issues (e. g., nitrate-vulnerable zones, Natura 2000 sites, river basins under the Water Framework Directive).

While a growing body of literature has demonstrated several positive impacts of agroecology, evidence of policy contribution to the agroecological transition of farming systems remains fragmented because of heterogeneous concepts and principles, methods, differing scales and timeframes, as well as knowledge gaps. Facing these challenges, the Into-Dialogue project performed a broad, albeit not exhaustive, systematic literature review on the existing frameworks, methods and indicators used in evaluating policies aiming at promoting the sustainable management of agricultural soils.

As a result, what is expected is a conceptual framework will serve as a reference for the continuation of Into-Dialogue project activities. Results reveal how differently soil-based agroecological principles and approaches are embedded into national and regional policies and measures and which are the needs behind.

In this perspective the study represents the initiation and strengthening of a transitional path to agroecology which cannot disregard from the development of consistent and effective political processes.

Keywords: Policy evaluation; Land use challenges; agroecology.

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Is there a Stakeholder Dialogue when looking for the integration of soil-based principles in agroecological systems?

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Into-DIALOGUE is a project funded by the EJP-Soil, focused on finding tools to facilitate stakeholder dialogue for the integration of soil-based principles in agroecological systems, in European and Turkish agricultural landscapes. This may be difficult to achieve, in the short term, given the complexity of holistically adopting Agroecology principles. Into-DIALOGUE will provide an integrative multi-stakeholder approach to the integration of soil-based systems, farmers' ecological identity, the design of policy measures and the collaborative possibilities offered by citizen participation to facilitate the transition.

The project partners cover a diagonal transect that includes different climatic regions and very diverse environments, from southwestern to northeastern Europe (Spain, Italy, Czech Republic, Poland, Lithuania and Latvia), with Turkey contributing its own landscapes.

Into-DIALOGUE addresses the challenge of finding out whether the Ecological Identity of Farmers in these countries is directly related to the implementation of agroecological practices in soil management. Which of the soil-based practices, that make up an agroecological system, can be more easily incorporated by farmers? In order to design specific policies at EU and Turkish level, it is essential to provide an overview of the ecological identity of farmers, and their Dialogues with other actors managing the agricultural landscape.

Keywords: Stakeholders dialogue; Farmers ecological identity; Agroecological systems; agroecological soil-based principles.

Fostering soil management PRACTices and uptake and developing decision support TOols through LIVing labs in EU (PRAC2LIV)

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The project PRAC2LIV will make and evaluate a stock-take of Decision Support Tools (DSTs) that focus on soil organic matter, water retention, and nutrient use efficiency as currently used by EJP Member States. Building on previous stocktakes, EU-projects and national reports, the overview will include DSTs from simple tools to the next generation level support systems. Both the scientific base of DSTs as well as their implementation and adoption at farm level will be assessed, with special attention for soil management practices, regional distance-to-target options, and data sharing for web-portal applications. Guidelines for development of DSTs and designs for (mock-up) web-portal and/or dashboards will be discussed in workshop exchanges with stakeholders. Relevant farming groups will be selected from national projects and/or Living Labs following the Mission Board on Soil Health and Food. The selection will include, if possible, groups with and without experience with selected DSTs. A general script for a workshop will be written based on previous expertise and the literature. The mock-up designs for web-portal and/or dashboard will be translated into the language of countries where the workshops are taking place. Based on the results from the stocktake and these discussions, a tiered approach will be developed for future development of DSTs in agro-ecosystems across EJP Member States.

Keywords: stock-take, Decision Support Tool, sustainable soil management, living Lab

Abstracts of Poster Presentations

Barriers and opportunities of soil knowledge to address soil challenges: Stakeholders' perspectives across Europe

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Climate-smart sustainable management of agricultural soil is critical to improve soil health, enhance food and water security, contribute to climate change mitigation and adaptation, biodiversity preservation, and improve human health and wellbeing. The European Joint Programme for Soil (EJP SOIL) started in 2020 with the aim to significantly improve soil management knowledge and create a sustainable and integrated European soil research system. EJP SOIL involves more than 350 scientists across 24 Countries and has been addressing multiple aspects associated with soil management across different European agroecosystems. This study summarizes the key findings of stakeholder consultations conducted at the national level across 20 countries with the aim to identify important barriers and challenges currently affecting soil knowledge but also assess opportunities to overcome these obstacles. Our findings demonstrate that there is significant room for improvement in terms of knowledge production, dissemination and adoption. Among the most important barriers identified by consulted stakeholders are technical, political, social and economic obstacles, which strongly limit the development and full exploitation of the outcomes of soil research. The main soil challenge across consulted member states remains to improve soil organic matter and peat soil conservation while soil water storage capacity is a key challenge in Southern Europe. Findings from this study clearly suggest that going forward climate-smart sustainable soil management will benefit from (1) increases in research funding, (2) the maintenance and valorisation of long-term (field) experiments, (3) the creation of knowledge sharing networks and interlinked national and European infrastructures, and (4) the development of regionally-tailored soil management strategies. All the above-mentioned interventions can contribute to the creation of healthy, resilient and sustainable soil ecosystems across Europe.

Keywords: agricultural soils; soil knowledge, soil organic matter, water storage capacity

Towards agricultural system innovation through crop diversity in the Living Lab 'Nature inclusive agriculture, North-Netherlands'

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Keywords: agroecology; strip cropping; transition; ecosystem services

Agriculture in The Netherlands is challenged with biodiversity loss and restriction on inputs like nutrients and pesticides. The number of active farmers is decreasing. It is argued that a new perspective on agriculture is needed for transition and institutional change, transition towards a system that meets ecological and socio-cultural targets. The regional scale could be focus of the agroecological transition, because climate, soil, hydrological and social-cultural values are often regionally defined. In the Netherlands, the region of the Veenkolonien requires a redesign of its agroecosystems, due to, e.g. soil degradation, narrow cropping plan, and difficulties to earn an income out of arable farming. This region is characterized by starch potato, reclaimed peat soil with slow degradable organic matter and poor mineralization of nutrients. Based on the literature and explorative work, crop diversity may be part of the solution, as results on soil biodiversity and innovative fertilization are promising. Crop diversity has been identified as promising for sustainable crop production and other ecosystem services. Intercropping and mixed cropping is challenging in a context of large-scale, mechanized agriculture, crop diversification through strip cropping offers opportunities for this transition at regional level of the Veenkolonien. A strip cropping experiment is set up in spring 2023 for at least 2 growing seasons, at the WUR experimental farm in Valthermond, Netherlands. The experimental design includes 4 treatments: organically managed strips (6 m), conventional managed strips (6 m), and conventional+ managed strips (6m, conventional at the cutting edge) and conventional+ managed strips of 12 m width. The 4 strip cropping systems will be monitored for yield, pest & diseases, biodiversity, soil parameters and economic performance. A regional living lab is being formed to explore and further develop strip cropping alternatives with local stakeholders: arable farmers (10-15), market companies (like potato and sugar beet companies), regional government, knowledge institutions and citizens (cooperatives). The experimental farm serves as a light house, where practices are implemented that impact on carbon sequestration, nitrogen use efficiency, moisture management and biodiversity. This part of the work could be done in cooperation with Farm of the future Veenkolonien (concept of farm demonstration fields were

practice ready innovations come together) and EJP Soil project PRAC2LIV. The later project develops a framework with guidelines for the development of 'decision support tools' and/or a web portal on the subjects mentioned above. For this purpose, a regional assessment of the guidelines is carried out in the Living Lab. The approach of this type of agroecological transition, i.e. crop diversity as a base for system change, and the implementation of a living lab for upscaling to the regional level, will be discussed. The expected outcome is that through co-creation of knowledge in a living lab, new and innovative connections between stakeholders will be made. Farmers get support in adopting agroecological innovations, and will be able to earn an income while taking care of the ecosystem. Question to be discussed at the poster presentation: which connections may be expected in the combination of crop diversity and a living lab?

Participatory approaches to address Water-Ecosystems-Food Nexus challenges:
focus on Italian pilot case

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Multi-actor approaches are increasingly recognized in Nexus research as the most effective way to identify divergent interests and interdependencies between usually "siloeed" management sectors, as a fundamental basis for developing effective decision support tools and innovative policy and technical strategies. In the framework of the PRIMA project LENSES (LEarning and action alliances for NexuS EnvironmentS in an uncertain future), we developed a methodological approach to implement a cross-sectoral and multi-level participatory process in the Tarquinia Plain (Italy), as part of a broader research context that included seven pilots across the Mediterranean. Systematic methodologies for stakeholders analysis and engagement, as well as mutual learning activities for knowledge sharing were applied to develop a shared understanding of local societal challenges and potential sustainable innovations in farming practices, land, and water management.

In the first phase, stakeholder analysis methodologies enabled the identification of a large and diverse range of local stakeholders across the key local Nexus domains. By assessing and visualizing their interests and power, we were able to explore potential collaborations and conflicts, making explicit the linkages between different actors and their stakes in resource use and management. The results of the stakeholder analysis were used to recommend and develop strategies for stakeholder engagement and to support the design of tools for knowledge sharing, by the establishment of a Learning and Action Alliance (LAA) in the study area. The LAA was designed as a virtual space where cross-cutting participatory tools and mutual learning activities could be developed. In the LAA environment, we established a structured visioning process through sketches, mind maps, videos, interviews, etc. to help create a shared vision towards which decision-makers can move when discussing how to address systemic Nexus challenges, or step back from to provide feedback in an iterative process. To further support cross-sectoral and multi-level stakeholder engagement, Participatory System Dynamic Modelling (PSDM) was selected in view of its proven ability to account for complex, non-linear interactions in Nexus systems and facilitate the integration of models/data and stakeholder knowledge. PSDM for collaborative learning was introduced into the LAA environment as a robust approach for the creation and analysis of scenarios with stakeholders at multiple scales, with the final aim of co-design suitable, innovative policy and technical strategies for sustainable resource management in the pilot area.

The results obtained will serve to provide decision-makers with a "Solution Selection Framework" as evidence-based tool to support the selection of management alternatives in addressing Water-

Ecosystem-Food Nexus challenges at the pilot scale, with the ultimate goal of developing an effective and widely accepted roadmap for the transition to integrated, sustainable management of agri-environmental resources.

Keywords: *Stakeholder analysis and engagement; Participatory approach; WEF Nexus; Resource management innovation; Farming practices; Sustainability.*