This project is part of the PRIMA programme supported by the European Union

**PRIMA-SECTION 2-2022**

**"Modelling and Technological Tools to Prevent Surface and Ground-Water Bodies from Agricultural Non-Point Source Pollution Under Mediterranean Conditions"**

**NPP-SOL**

# Settlement Document of the SHR, Including a Detailed Workplan of the SHR with Activities and Related Procedures

## Deliverable number: D1.1

This project is part of the PRIMA programme supported by the European Union

Project Acronym: NPP-SOL

Project Full Title: Modelling and Technological Tools to Prevent Surface and Ground-Water Bodies from Agricultural Non-Point Source Pollution Under Mediterranean Conditions

Call: PRIMA Section 2 2022

Topic: PRIMA Section 2 2022- Multi-topic 2.1.1 RIA

Type of Action: Multi-topic Topic 2.1.1 RIA (Prevent and reduce land and water salinization and pollution due to agri-food activities).

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| **Call** | PRIMA Section 2 2022- Multi-topic<br>Topic 2.1.1 RIA (Prevent and reduce land and water salinization and pollution due to agri-food activities). |
| **Project website** | https://mel.cgiar.org/projects/npp-sol |

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## Acronyms

AD = Anaerobic Digesters
BR = Bioreactors
BF = Biofiltration
CAFO = Concentrated Animal Feeding Operations
CS = Case Studies
CW = Constructed Wetland
CT = Co-Testing
IEA = Environmental Agencies
IAMM = Institut Agronomique Méditerranéen de Montpellier
FA = Farmer Awareness
FU = Field Unit
GAP = Good Agricultural Practice
GDFF = Green Deal and Farm-to-Fork strategies
FLOWS-HAGES = Dynamic Agro-Hydrological Model
HTC = Hydrothermal Carbonization
KPI = Key Performance Indicators
MOAN = Mediterranean Organic Agriculture Network
MT = Modelling Tools
NPS= Non-Point Source
NPP = Non-Point Pollution
NVZ=Nitrate Vulnerable Zones
PPT = Pollution-Preventing Technologies
PMB = Project Management Board
PSA = Pollutant Sources Analysis
SAB = Scientific Advisory Board
SSBM = Site-Specific Best Management Practices
SO = Specific Objectives
SE = Stakeholders Entities
SC = Steering Committee
SHR-HUB = Stakeholders-Researchers HUB
SO = Specific Objectives
TCB = Technical Capacity Building
US = Upscaling
WP = Work Package
WUA = Water User Associations
WRM = Water Resource Managers
FLOWS-HAGES = Flows of Water and Solute Transport in Heterogeneous Agricultural and Environmental Systems
DAHBSIM = Dynamic Agricultural Household Bio-Economic Simulation Model

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# 1. Introduction

## Premise

This document is developed in the framework of the NPP-SOL project, a Research and Innovation (RIA) project funded by the European programme PRIMA. The project was financed by the PRIMA Section 2 Multi-topics 2022. The expected impacts of NPP-SOL will contribute to implementing the expected outputs and outcomes indicated in the PRIMA-SRIA. The project contributes to the following SRIA priorities:

1.1 Water resources availability and quality within catchments and aquifers

2.2 Developing sustainable and productive agro-ecosystems.

Specifically, it contributes to the expected impacts in the work programme under Topic 2.1.1 RIA Prevent and reduce land and water salinisation and pollution due to agri-food activities. Under the Topic Challenge, NPP-SOL addresses the connection between surface water and groundwater exploitation and poor groundwater quality, the salinisation of aquifers and the prevention of eutrophication of wetlands and water bodies. It also promotes sustainable agricultural practices and reduces agricultural Non-Point Source (NPS) pollution that carries phosphorus, nitrogen, pesticides, other organic pollutants, metals, pathogens, salts, and trace elements. Topic 2.1.1 did not precisely settle a Multi-Actor Approach (MAA) to tackle the challenges of improving the effectiveness and sustainability of Water management in the Mediterranean area. However, the approach is intrinsic to the project. NPP-SOL aims to guarantee site-tailored and affordable-cost solutions for each case study. Several disciplines converge throughout the project, and several actors, other than project partners, are called upon to create impactful solutions, i.e., exploitable and sustainable beyond the project. Hence, there is a willingness to construct a central project hub called Stakeholder and Researcher Hub (SHR-HUB) and four local hub branches, NPP-SOL Local Hub, in the case study areas where an MAA will be integrated. Hubs are the primary forms for co-learning and co-construction knowledge and for exchanging expertise among the multiple participants engaged in a project.

Facilitating an inclusive dialogue is pivotal, creating a space where stakeholders can share opinions and concerns openly. Furthermore, it is important to adopt communication methods that are accessible and understandable to all participants, respecting and reflecting the diversity of communication styles and languages involved. Pivotal players in developing the NPP-SOL Hubs will be the project participants with the support and guidance of IAMM[1], 'pioneering' the construction of Living Labs in other European projects and the Kalos[2] association, an association driven by a willingness to explore innovative collaboration models aimed at enhancing the effectiveness of European projects' impact.

[1] https://www.iamm.ciheam.org/fr/
[2] https://kalos-coopera.org/

## 1.1 Purpose of this document: a dynamic document

This document outlines the process for constructing and engaging with the NPP-SOL SHR-HUB and four local hubs. The initial version is delivered at the project's onset following the Kick-Off Meeting (KOM). It will undergo several revisions detailing the undertaken process and the adjustments made to ensure the project's aim is met - namely, tailoring the project's outcomes to the implementation contexts.

The hub-building process outlined in Deliverable 1.1, both in its current and future versions, aims to foster the development of diverse communities of practice, striving to prioritise real-world contexts. Inspired by participatory models and experiences, it aims i) to empower project partners, stakeholders and end users to develop and evaluate impactful solutions in water and agri-food systems and ii) to reduce the gap between scientific research and its application in society and politics.

## 1.2 To whom this document is addressed

This document targets a range of potential users. Firstly, it aims to guarantee that partners i) are aware of and adhere to established procedures for selecting and engaging suitable stakeholders in the project and ii) recognise the usefulness of taking time to be involved in the construction of the NPP-SOL hubs. To follow the partners, also referred to here as the beneficiaries of the PRIMA project NPP-SOL:

| Partner/Beneficiaries | Acronym | Countries |
|---|---|---|
| University of Basilicata | UNIBAS | Italy |
| University of Cagliari | UNICA | Italy |
| Universitat de Barcelona | UB | Spain |
| Mediterranean Agronomic Institute of Montpellier | IAMM | France |
| Agricultural Research Organization – Volcani Institute | ARO | Israel |
| Ministry of Agriculture and Rural Development | MOAG | Israel |
| National Institute of Agricultural Research | INRA | Morocco |
| Mohammed V University of Rabat | UM5 | Morocco |

Table 1. Project partners and belonging countries

In parallel, it addresses external stakeholders (regional authorities, farmer associations, end users, researchers, and external consultants) who freely participated and supervised the appropriateness and feasibility of the project activities according to their context. Their involvement will provide a unique opportunity to fine-tune ideas, redefine local objectives, and spread local knowledge. The initial key stakeholders identified by each partner during the project drafting phase were reviewed and expanded upon after the KOM. Project partners

confirmed, modified, and increased the potential Stakeholders' Entities (SE) to be involved in constructing the local hubs.

# 2. NPP SOL Project

## 2.1 NPP-SOL project brief presentation

The main objective of the NPP-SOL project is to prevent diffuse pollution of water resources due to NPS agricultural pollutants under the Mediterranean soil and environmental conditions, according to the objectives of the new Green Deal and Farm-to-Fork strategies.

To achieve the primary goal of the NPP-SOL project, four specific goals were identified:

- Providing Modelling Tools (MT) integrating dynamics, physically-based agro-hydrological models to bioeconomic models to evaluate alternative soil, water, and crop management strategies, reducing nutrient losses in water bodies, improving crop productivity, and identifying the proper nutrient management under saline irrigation water. MT will support Site-Specific Best Management Practices (SSBMP) and Pollution-Preventing Technologies (PPT) design.
- Co-designing SSBMP to improve soil, water and crop management and efficiently use irrigation water and nutrients under site-specific pedo-hydrological, agronomic, economic and climatic conditions.
- Co-designing, implementing and testing small-to-medium, affordable-costs, in situ bioremediation and nature-based PPT aiming to intercept and remove NPS pollutants before they reach the groundwater and surface water bodies. Specifically, Bioreactors (BR) and a Constructed Wetland (CW) will be set up to remove nutrients (and pesticides) from surface runoff and/or drainage water coming from agricultural fields, whereas Anaerobic Digesters (AD) will be set up to preliminary treat livestock slurries before they are spread to the soil.
- Developing Farmer Awareness (FA) and Technical Capacity Building (TCB) of technicians from Water User Associations (WUA), Environmental Agencies (EA), and Water Resource Managers (WRM) to apply and spread NPP-SOL SSBMP and PPT throughout the area affected by NPS pollution, monitor the effectiveness of applied technologies, manage maintenance and fine-tuning over time, and support the farmers beyond the lifetime of the project.

The structure of the NPP-SOL work plan is based on three main pillars: advance beyond the state-of-the-art, improve technology and address public engagement and social challenges. Six work packages that support each other have been developed to maintain this work structure and achieve the project's specific objectives.

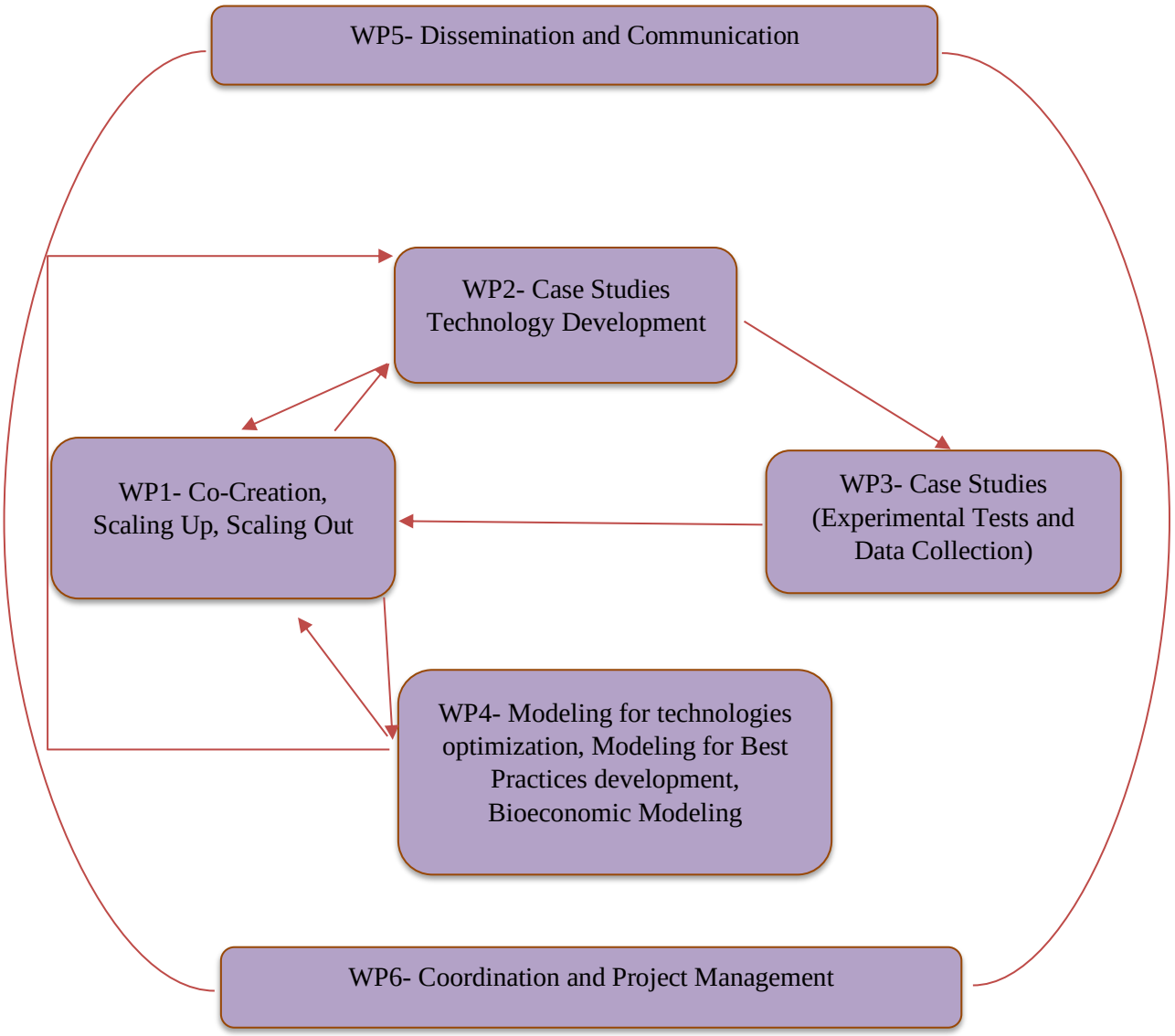


*Figure 1. All WPs of NPP-SOL*

## 2.2 WP1 brief presentation

As a part of the NPP-SOL project, WP1 (leader IAMM) is co-creation, scaling up and scaling out aim to achieve these objectives:

- Settling of the project SHR-Hub and the four living hubs, one for each case study.
- Defining SE driven advice and guidelines to develop the MT in the WP4.
- Identifying scaling up and scaling out opportunities of the SSBMP and PPT solutions.

WP1 will last for the entire duration of the project, and to achieve these objectives, three different tasks were identified. The first task is multi-stakeholder board engagement and co-design of scenarios and solutions based on the needs and problems related to NPS pollution in each study area. The second task is the conceptualisation

of an operational multidimensional and multiscale integrated MT. The third task is scaling up and scaling out SSBMP and PPT solutions.

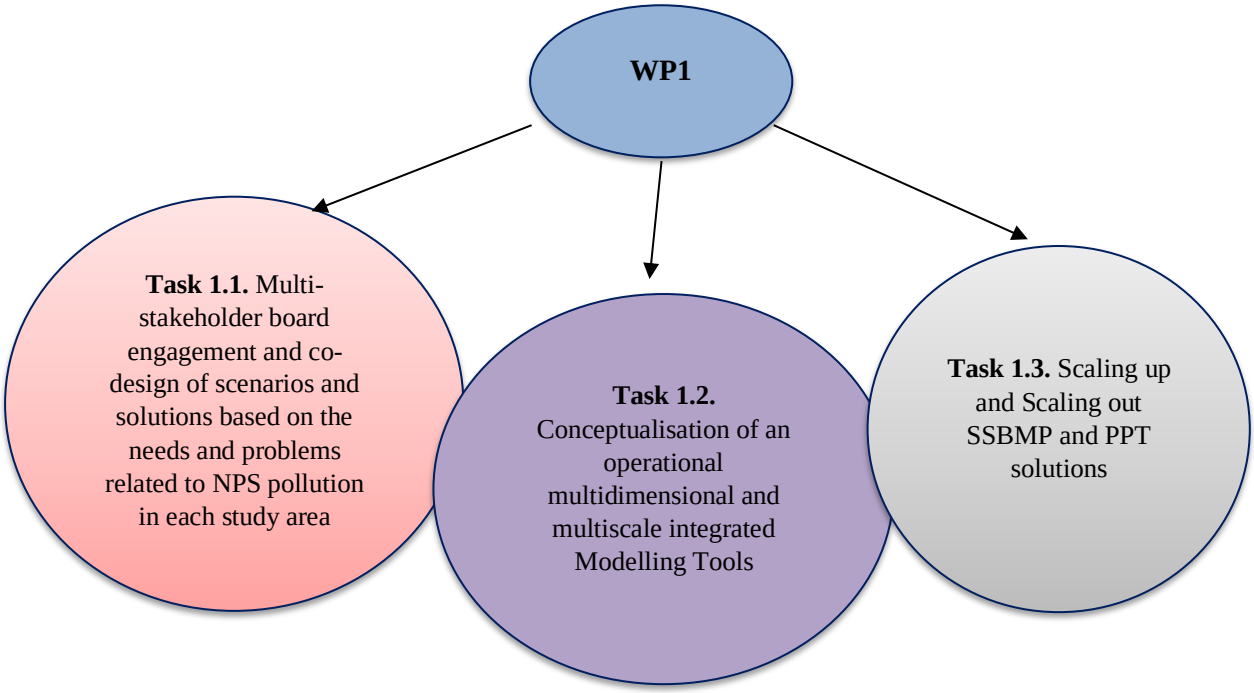


*Figure 2. WP1 and its tasks*

## 2.3 NPP-SOL SHR HUB: description and composition

The first activities of the project will be the ones in WP1 co-creation, scaling op, and scaling out. WP1 sets the foundation for the implementation of the scientific-technical activities of NPP-SOL. At the core of WP1 is the creating and governance of an open group of stakeholders and researchers called Stakeholders Entities and Researchers Hub (SHR-HUB). NPP-SOL SHR-HUB is an open and free space to host NPP-SOL's regional project partners, their SE, researchers and new actors yet to come. NPP-SOL SHR-HUB will test, pilot and co-design innovative and new practices in the NPP-SOL project to context-adapt project results and generate greater impact. The SHR-HUB will be beneficial to ensure horizontal management of project activities and supervise that the proposed interventions are appropriate, and that the knowledge generated by the project can be exploited. Considering these basic objectives, four local hubs establish to represent and coordinate each case study.

NPP-SOL local hubs aim to provide coordination the work of the local hubs, continuous updates on the evolving needs and problems to be solved in each study area, receive and process the results from the technical

WPs, orient the modelling conceptualisations, scenarios, and methodologies for the development of the SSBMP, and provide new inputs to reshape the design and/or operational parameters of the PPTs.

For an excellent composition of each local hub, at least 2-3 persons working at SE and at least two researchers from the NPP-SOL project will be involved. The main structure of SHR-HUB is designed:

- to ensure interactions with engaged SE and researchers,
- to identify potential gaps between what has been planned and what is being implemented,
- co-design unforeseen activities to adapt project activities to the context,
- to monitor the effective achievement and utilisation of the project's results and
- to build sharing tools and empower people to participate in EU program.

The local hubs are part of the NPP-SOL SHR-HUB, which is a collaborative and multi-method approach that integrates multi-stakeholder participation that enables stakeholders to identify needs relevant to their territory, co-design and test methods and tools, validate data and indicators and contribute to long-term and sustainable solutions. Each local hub will organise physical and virtual meetings and technical round tables to:

- co-design of local - macro and micro–objectives and relative Key Performance Indicators (KPI),

- co-design of participatory monitoring techniques and tools,

- co-design the Technical Capacity Building and awareness-raising activities for farmers

- co-design of future project proposals (based on partners' previous experiences and local objectives on a short - and long-term basis),

- define how far the identified SSBMP and PPT combinations can answer stakeholders' expectations and reduce the risk of conflicts/pollution[3].

The local hubs participants will be involved through various project activities. Their participation will provide added value for the implementation of the NPP-SOL scheduled activities (see 4.3). Local hub participants will be involved to support the site characterisation sharing knowledge, experience and practices on farming systems, characterisation and engagement, collection of groundwater and agricultural practices, economic/entrepreneurial systems knowledge, governance and institutional assessment. Additionally, local hubs will be asked to outline the training needs for participants and end-users engaged in the project, covering

[3] NPP-SOL will develop in situ low cost, bioremediation and nature-based solutions aiming to intercept and remove NPS pollutants before they reach the groundwater and surface water bodies.
Specifically: Modelling Tools to provide quantitative predictions of NPS pollutant transport; Pollution-Preventing Technologies, such as Bioreactors (BR) and a Constructed Wetland (CW) to remove nutrients (and pesticides) from surface runoff and/or drainage water coming from agricultural fields, and Anaerobic Digestors (AD) to preliminary treat livestock slurries before they are spread to the soil. Technical Capacity Building and Farmers Awareness activities are equally planned and provided to ensure a fair application of these solutions.

both the trainees and the training facilitators, and will be called upon to provide suggestions and guidance for the development of dissemination and communication and transferability and exploitation plans.

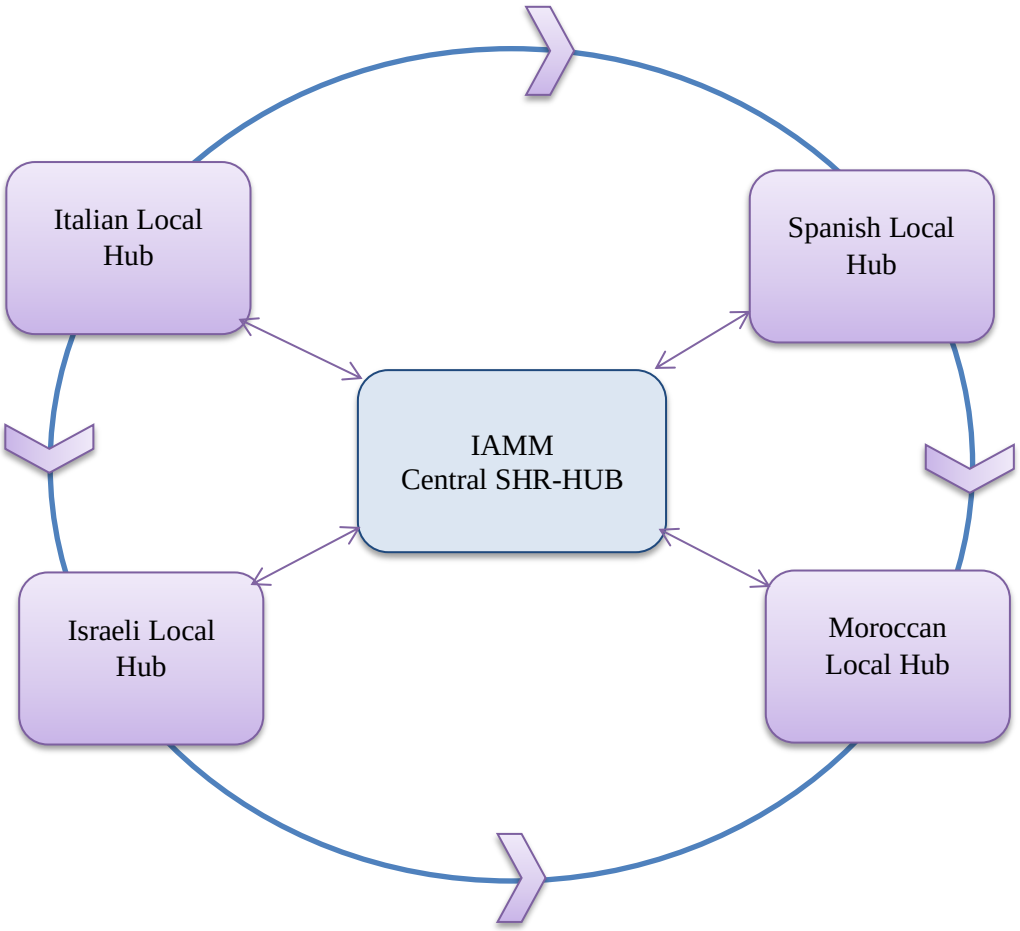


*Figure 3. NPP-SOL Local SHR-HUB*

## 2.4 Local Hubs

After the KOM held in Italy and virtual meetings with project researchers, work began on the formulation, organization and basic features of local hubs, and efforts are being made to create an identity card for local hubs. The purpose of this ID card is to create a profile for each local hub and to finalize it by the first year of the project. This section presents the main features of the four local hub in NPP-SOL (Italy, Israel, Spain and Morocco) and their structure.

### 2.4.1. Local Hub in Italy

The Italian local hub is currently in the process of being created in collaboration with UNIBAS, UNICA and IAMM. Italian local hub will be located in Arborea which is a town in the province of Oristano, Sardinia, Italy. This territory has various economic activities mainly based on agriculture and livestock. Due to its proximity to the research area, the location of the local hub in the region is important in terms of accessibility to local stakeholders, as well as in terms of eliminating transportation and time constraints.

The research area, Arborea Plain, is a hydraulic reclamation area under the management of the Oristano Land Reclamation and Irrigation consortium. The main problem in the region is that animal manure, slurries and synthetic nitrogenous fertilizers applied to the fields reach the groundwater and also reach the S'Ena Arrubia natural wetland, a natural protected area recognized by the EU. Within the scope of the project, it is aimed to install farm-scale bioreactors on an area of approximately 15 hectares.

Table 2 shows the Italian local hub ID and according to the first draft, this ID will be developed through a focus group and other internal meetings, identifying the main facilitator of the hub, its thematic priorities and the SE involved in this hub.

| Location |
|---|
| being discussed |
| Contacts |
| being discussed |
| Priorities |
| being discussed |
| Stakeholder Entities |
| Oristano Land Reclamation and Irrigation Consortium<br>River Basin District Agencies (ADIS)<br>Regional Environmental Agencies of Sardinia (ARPAS)<br>Arborea Farmers Association (3A) |

*Table 2. Italian Local Hub ID*

### 2.4.2. Local Hub in Israel

The Israeli local hub is currently in the process of being created in collaboration with ARO, MOAG and IAMM. Israeli Local Hub will be located in Newe Ya'ar Reserch Center. Newe Ya'ar is located in Jezreel Valley Regional Council in the province of Northern Israel.

The research area, Nahalal Stream, is a restoration project nearby Newe Ya'ar Research Center. The main problem in the region is that untreated manure, liquid effluents from a Concentrated Animal Feeding Operation (CAFO) and agricultural runoff with residual nitrogenous fertilizers applied to the fields nearby. Within the scope of the project, it is aimed to install a farm-scale AD and a BR on this area.

Table 3 shows the Israeli local hub ID and according to the first draft, this ID will be developed through a focus group and other internal meetings, identifying the main facilitator of the hub, its thematic priorities and the SE involved in this hub.

| Location |
|---|
| Newe Ya'ar Reserch Center (Israel) |
| Contacts |
| Dr. Roy Posmanik<br>posmanik@volcani.agri.gov.il |
| Priorities |
| being discussed |
| Stakeholder Entities |
| Kishon River Drainage Authority<br>Jezreel Valley Framers Center<br>Ministry of Environmental Protection<br>Ministry of Agriculture and Rural Development - Regional Office<br>Zippory Stream Restoration Project<br>Yarkon River Drainage Authority<br>ICL Group LTD |

*Table 3. Israeli Local Hub ID*

### 2.4.3. Local Hub in Spain

The Spanish local hub is currently in the process of being created in collaboration with UB and IAMM. Spanish local hub will be located in Lerma basin which is a town in the province of Northeast Spain. This territory has various agricultural activities such as maize, barley, peas, sunflower and tomato. Due to its proximity to the

research area, the location of the local hub in the region is important in terms of accessibility to local stakeholders, as well as in terms of eliminating transportation and time constraints.

The research area, Lerma basin, is a hydraulic area located nearby Ebro River Valley, in Northeast Spain, in the Arba River Basin. The main problem in the region is that compound and liquid NPK fertilizers. Within the scope of the project, it is aimed to set up CW on the area.

Table 3 shows the Spanish local hub ID and according to the first draft, this ID will be developed through a focus group and other internal meetings, identifying the main facilitator of the hub, its thematic priorities and the SE involved in this hub.

| Location |
|---|
| being discussed |
| Contacts |
| Dr Rosanna Margalef-Marti<br>rosannamargalef@ub.edu |
| Priorities |
| being discussed |
| Stakeholder Entities |
| Spanish Geological Survey (IGME, Instituto Geológico y Minero de España)<br>Cooperativa de Agricultores "Virgen de la Oliva"<br>Community of Irrigators nº XI of the Bardenas Canal<br>Confederación Hidrográfica del Ebro (CHE)<br>Comunidad General Canal de Bardenas<br>Quesería Biota (Cheese factory Biota) |

*Table 4. Spanish Local Hub ID*

### 2.4.4. Local Hub in Morocco

The Moroccan local hub is currently in the process of being created in collaboration with INRA, UM5 and IAMM. Moroccan local hub will be located in Gharb region situated North-western Morocco. Agriculture is the leading economic activity in this region. Due to its proximity to the research area, the location of the local hub in the region is important in terms of accessibility to local stakeholders, as well as in terms of eliminating transportation and time constraints.

The research area, Gharb, is an irrigated area and located in Northwest of Morocco. Agriculture and livestock are the main economic activities in this region. The main problem in the region is nitrates and salinity. Within the scope of the project, it is aimed to install farm-scale BR on the area.

Table 4 shows the Moroccan local hub ID and according to the first draft, this ID will be developed through a focus group and other internal meetings, identifying the main facilitator of the hub, its thematic priorities and the SE involved in this hub.

| Location |
| --- |
| being discussed |
| Contacts |
| Hatim Sanad<br>hatim.sanad99@gmail.com |
| Priorities |
| being discussed |
| Stakeholder Entities |
| Regional Office for Agricultural Development of Gharb (ORMVAG)<br>National Agricultural Advisory Office (ONCA) |

*Table 5. Moroccan Local Hub ID*

# 3. NPP SOL SHR HUB: working methodology

## 3.1 A theoretical and practical foundation

### Terminology

In a multi-partner project, establishing a shared terminology is crucial. If commonly used terms, concepts, criteria, rules, or models aren't acknowledged and understood collectively, it becomes impossible to drive forward with a constructive approach that facilitates actions, reflections, participative evaluations, and overall developmental progress. Key term descriptions and a living glossary throughout the project will provide clear reference points for all participants and beyond. Language differences can often lead to misinterpretations of key ideas; therefore, these differences will be considered when delivering all hub activities.

What is a hub? Hints of history

If we search for the etymology of the word, we have to go back to the 1st century AD PLINIUS (Pliny)[4], where *hub*, from the latin word *modiolus,i*, is considered as a central part of a wheel. This means that a *hub* is the **central piece that enables a mechanism to function, which induces its movement**. A *hub* makes things move forward. From this focal point everything starts. Describing a place, physical or virtual, as a "hub" implies it's a central role within a specific activity or context.

### A brief literature

The adoption of hubs in European projects reflects a trend towards fostering coordination and interdisciplinary approaches. Hubs serve as central points for bringing together various stakeholders, including researchers, scientists, practitioners, policymakers, community representatives, and sector associations. Introducing hubs in European projects is a strategic approach to enhance collaboration, engagement, and the overall effectiveness of initiatives that tackle complex challenges with societal implications. In addition, creating hubs brings us closer to the field and aims to reduce the project implementation gap. The positive cross-fertilisation between different participants at different levels of society (public, private, civil, voluntary, cooperative, etc.) should ensure that the project is more closely aligned with reality and can be adapted and evaluated continuously.

A literature review will support the building process of the NPP-SOL SHR HUB by exploring relevant areas of research and applied studies in implemented and ongoing European projects.

Relevant research areas to be investigated at this stage include the MAA[5] to stakeholder engagement, beneficiary empowerment, participatory processes and power gaps. Considering the power of experiential

[4] https://www.dicolatin.com/Latin/Lexie/0/MODIOLUS

[5] The Multi-Actor Approach was adopted by the European Commission in its strategy for EU agricultural research and innovation (European Commission, 2016). The aim is to "boost demand-driven innovation and the implementation of

learning, a comprehensive review will be conducted of European projects that have implemented activities related to establishing project hubs. This analysis will focus on projects that have employed the Multi-Actor Approach (MAA) to attain their expected goals and those where such frameworks have been theoretically elucidated. Initially, we focus on projects involving IAMM, such as SHERPA[6], NATAE[7] and EXCEL4MED[8] projects. We will pursue research via CORDIS and other public platforms that disseminate project findings. Projects such as Uniseco[9], Meat Quality[10], SIMRA[11], DESIRA[12], GRANULAR[13], AGREEMed[14], will be taken as reference and inspiration.

**SHERPA** (Sustainable Hub to Engage into Rural Policies with Actors) was a four-year project conducted 2019-2023 with seventeen partners funded by Horizon Europe. The project aimed to 'gather knowledge that contributes to the formulation of recommendations for future policies relevant to EU rural areas, by creating a Science-Society-Policy interface which provides a hub for knowledge and policy'. To achieve this main objective the project developed seven work packages and used participatory multi-actor approach.

**NATAE** (North African Transition to Agroecology) is a four-year project conduct 2022-2026 with twenty-two partners funded by Horizon Europe. The project aims to 'bring together high-level research and education institutions from around the Mediterranean, international organizations and specialized NGOs with long-term presence on the ground to demonstrate that agro-ecological approaches, tailored locally to the diversity of farming systems, can offer adequate solutions to food system challenges in North Africa. To achieve this main objective the project developed seven work packages and uses Living Lab approaches.

**GRANULAR** (Giving Rural Actors Novel Data and Re-Usable Tools to Lead Public Action in Rural Areas) is a four-year project conduct 2022-2026 with twenty-four partners funded by Horizon Europe. The project aims to 'generate new datasets, tools and methods to better understand rural areas.' To achieve this main objective the project developed seven work packages and uses multi-actor approaches.

**EXCEL4MED** (Excellence Hub in Green Technologies: Introducing innovation ecosystems in the Mediterranean Food Value Chain) is a four-year project 2023-2027 with fourteen partners funded by Horizon Europe. The project aims to 'create an Excellence Hub in Mediterranean fruit supply chains.' To achieve this main objective the project developed six work packages and uses Living Lab approaches[15].

research, creating synergies between EU policies", and increase impacts through the process of genuine co-creation of knowledge, focusing on real problems and opportunities (EIP-AGRI, 2017).

[6] https://rural-interfaces.eu/
[7] https://www.natae-agroecology.eu/about/
[8] https://excel4med.eu/
[9] https://uniseco-project.eu/
[10] https://meatquality.eu/
[11] http://www.simra-h2020.eu/
[12] https://desira2020.agr.unipi.it/
[13] https://www.ruralgranular.eu/work-packages-and-deliverables/
[14] https://agreemed.eu/

**AGREEMED** (Innovative Aquifers Governance for Resilient Water Management and Sustainable Ecosystems in Stressed Mediterranean Agricultural Areas) is a three-year project conduct 2022-2025 with ten partners funded by Prima. The project aims to 'improve the capacities of water actors in developing integrated aquifer management plans and demonstrating such development in strategic pilot areas'. To achieve this main objective the project developed eight work packages and uses multi-actor approaches.

**SIMRA** (Social Innovation in Marginalised Rural Areas) was a four-year project conducted 2016-2020 with twenty-six partners funded by Horizon Europe. The project aimed to 'fill the significant knowledge gap in understanding and enhancing social innovation in marginalised rural areas by advancing the state-of-art in social innovation and connected governance mechanisms in agriculture and forestry sectors in rural development in general'. To achieve this main objective the project developed eight work packages and used multi-actor approaches.

**UNISECO** (Understanding and Improving the Sustainability of Agro-Ecological Farming Systems in the EU) was a three-year project conducted 2018-2021 with eighteen partners funded by Horizon Europe. The project aimed to 'strengthen the sustainability of European farming systems, through co-constructing improved and practice-validated strategies and incentives for the promotion of improved agro-ecological approaches'. To achieve this main objective the project developed nine work packages and used multi-actor approaches.

**DESIRA** (Digitisation: Economic and Social Impacts in Rural Areas) was a four-year project conducted 2019-2023 with twenty-five partners funded by Horizon Europe. The project aimed to 'improve the capacity of society and political bodies to respond to the challenges that digitalisation generates in agriculture, forestry and rural areas'. To achieve this main objective the project developed seven work packages and used multi-actor and inter-disciplinary approaches.

**Meat Quality** (Linking Extensive Husbandry Practices to the Intrinsic Quality of Pork and Broiler Meat) is a four-year project conduct 2021-2025 with seventeen partners funded by Horizon Europe. The project aims to' provide consumers with quality pork and broiler meat, by developing novel solutions that address societal demands, environmental concerns and economic needs on farm and in the chain'. To achieve this main objective the project developed seven work packages and uses multi-actor approaches.

## 3.2 Process-based method

In collaborative projects involving diverse countries with distinct cultural backgrounds, perspectives, and priorities, it's vital to recognise pre-existing differences in information, culture, and perception. This requires a respectful and sensitive approach that allows each party to freely express its point of view. A process-based method refers to a working approach founded on the process itself. The NPP-SOL SHR HUB construction process will proceed through the project activities and adjust the expected outputs on the basis of the opportunities and possibilities that will arise as well as on the limitations and difficulties. A comprehensive

understanding of the local context of each participating country is essential. Environmental priorities may vary significantly depending on the specific local challenges, economic conditions and societal needs.

A process-based method will be applied to allow the co-creation to remain flexible, allowing for the integration of diverse perspectives and approaches. This flexibility fosters the creation of more inclusive and relevant solutions for all involved stakeholders. Moreover, clearly establishing the local's objectives and benefits is essential, highlighting how it aligns with local priorities and contributes to mutual benefits. Approaching the project in this manner creates space for more effective and inclusive collaboration, recognizing and respecting the differences among the participating countries.

By employing existing multi-actor theories, models, and approaches, participants in the NPP-SOL local hubs will be encouraged to collaborate. This collaboration aims to effectively adapt NPP-SOL models and technologies to the local context. This involvement (through context studies, online and on-site meetings, information exchange) aims to define local objectives and methods, and to establish reliable resilience indicators, while identifying significant risk variables and their thresholds within the study areas.

## 3.3 Peer Monitoring and evaluation

Continuous evaluation and feedback channels are crucial tools for adapting the activities of the local hubs as it progresses, ensuring its resilience and responsiveness to diverse and evolving needs over time. However, evaluating collaborative projects and multi-actor methodologies often presents challenges. Projects like NPP-SOL, characterised by cross-country nature, involvement of multiple stakeholders, and diverse objectives, struggle to establish robust impact indicators. This complexity creates hurdles in conducting a comprehensive evaluation. Choosing to conduct mid-term and final evaluations seems a reasonable approach. Evaluations provide the opportunity to refine strategies for the upcoming project phases. To ensure the effectiveness and practicality of evaluations, the indicators, nourished by data, should remain limited in number. They should be in line with the different levels of project implementation: objectives, results and activities. These indicators should be identified in cooperation with stakeholders, ensuring that they are easy to understand, monitor and cost-effective. To develop a robust and efficient - internal and external - evaluation methodology for the construction of local hubs, we will get inspiration from the work carried out by the projects mentioned in 3.1 by investigating theories and the main results, and we will develop context-based evaluation methodologies for each case study area. Evaluations serve a dual purpose: aiding project partners and key stakeholders in learning and adhering to new ideas and solutions. Making evaluation and monitoring outcomes - both internal and external - accessible to everyone, encourages commitment and accountability of participants in project activities and actively involves key stakeholders.

# 4. Establishment of the SHR HUB

## 4.1 Current progress

### NPP-SOL Kick Off Meeting

The NPP-SOL project started on October 1, 2023. Over the past three months leading up to this document, initial tentative steps towards constructing the NPP-SOL SHR Hub have been taken. During the KOM held in Cagliari, Italy, from November 6 to 8, the first information meeting was dedicated to the presentation of the NPP-SOL SHR Hub. Simultaneously, two separate one-hour-long sessions occurred - one involving Italian SE and partners present at the KOM and another with Spanish and Moroccan partners in attendance and Israelis remotely due to the ongoing war situation. No SE from Israel, Morocco or Spain participated in the KOM. The purpose of this meeting was to present and introduce the hub concept and its implications in the NPP SOL project to the partners. Additionally, a morning meeting has been dedicated to the Italian SE presentation. They presented their work and anticipated their needs. They report on the projects underway to improve the pollution site situation and the technological solutions they intend to develop.

Following the list of the Italian SE participating in the NPP-SOL KOM:

•Water Resources in Sardinia: Availability and Quality from the Hydrographic District Authority of Sardinia

•Nutrients and Crop Management in Arborea Plain from the Sardinian Agency for Agricultural Innovation and Research (Agris)

•Challenges Regarding Groundwater Quality in Sardinia from the Sardinia's Regional Agency for Environmental Protection (ARPAS)

•Initiatives Farmers Would Like to Develop to Reduce Nutrients Pollution from the Arborea's Farmers Association (3A)

We conducted a field visit to the Italian case study area during the KOM. We met a farmer who provides access to the Italian partners' researchers for measurements and experiments. The visit to his farm allowed the partners and external participants to see a small part of the context in which the project is called to act.

The field visit and the KOM enabled us to gather initial details and data about the Italian case study area and identify several initial concerns and needs.

### First remote meetings

Between November and mid-December 2023, four remote meetings were convened with the partners from the four case study areas. The primary objective of these meetings was to provide a concise overview of

establishing the Local Hub and identifying the participants. Through these sessions, several key outcomes were achieved:

•Recognizing initial scepticism among certain partners regarding the construction of the local hub, a sentiment deemed understandable at this project phase.

•Formulating an initial significant roster of the SE and Researchers for each country. All partners provided a list of the SE and researchers' participant names to be involved in forthcoming activities potentially.

•Consensus was reached about the local hub's venue. Location won't be fixed but decided on a case-by-case basis, tailored to the activities undertaken.

Table 6. Meetings held and participants

| | Location | Topics | Participants |
|---|---|---|---|
| **Meeting 1: 23.11.2023 Israel** | Online | The topic discussed at the meeting was the current researchers and stakeholders and possible new stakeholders who could be the participants for the Israeli local hub and the location of the hub. | Alessandra Morandi (Kalos), Aybike Bayraktar (IAMM), Nadia Maio (Kalos), Roy Posmanik (ARO), Roey Egozi (MOAG). |
| **Meeting 2: 24.11.2023 Spain** | Online | The topic discussed at the meeting was the current researchers and stakeholders and possible new stakeholders who could be the participants for the Spanish local hub and the location of the hub. | Albert Soler (UB), Alessandra Morandi (Kalos), Aybike Bayraktar (IAMM), Manuela Barbieri (UB), Rosanna Margalef (UB). |
| **Meeting 3: 30.11.2023 Italy** | Online | The topic discussed at the meeting was the current researchers and stakeholders and possible new stakeholders who could be the participants for the Italian local hub and the location of the hub. | Alessandro Comegna (UNIBAS), Alessandra Morandi (Kalos), Antonio Coppola (UNIBAS), Aybike Bayraktar (IAMM), Nadia Maio (Kalos), Shawkat Hassan (UNIBAS), Stefania Da Pelo (UNICA). |
| **Meeting 4: 05.12.2023 Morocco** | Online | The topic discussed at the meeting was the current researchers and stakeholders and possible new stakeholders who could be the participants for the Moroccan local hub and the location of the hub. | Abdelmjid Zouahri (INRA), Aybike Bayraktar (IAMM), Alessandra Morandi (Kalos), Beniken Lhou (INRA), Fatima Zahra El Omari (INRA). |

## 4.2 Future steps

### 4.2.1 General Methodology

Various methodologies such as Living Lab methodologies, brainstorming, workshops (to develop ideas, usability workshops and feedback workshops), observations, in-depth interviews and focus groups will be used

to achieve the aims of the project. However, the general methodology is the living lab methodology, which adapts and combines many elements such as co-creation, multi-method approach, user engagement, multi-stakeholder participation and real-life environment to suit its purposes.

Living lab projects are based on three main structures: exploration, experimentation and evaluation. The first step in the exploration process is to identify the current situation and think about and design possible future states. The main purpose of this phase is to understand the current situation and gain an overview of the current practices of the targeted users. At this stage, observation, participation and in-depth interviews are frequently used. After understanding the current situation, the focus is identifying opportunities to improve the user's situation. At this stage, brainstorming, idea generation and co-creation techniques are mainly used. The NPP-SOL project will use in-depth interviews and focus group work for the exploration phase. The second step is the experimentation phase, real-life testing of one or more proposed future states. The future situation determined in the first stage is transformed into a concept at this stage, and in this context, scenario(s) are developed and tested. In the final step, the evaluation stage, it is possible to discover the potential impact and added value created by the innovation.

After the KOM held in Italy (November 6-8) and virtual meetings with project researchers, work began on the formulation, organization and basic features of local hubs, and efforts are being made to create an identity card for local hubs. The purpose of these ID cards is to create a profile for each local hub and to finalize it by the first year of the project. Several specific steps have been determined for this first year of the project.

Step 1. To identify the general characteristics of the local hubs, including geographical characteristics, boundaries, and challenges where the local hub is located.

Step 2. To identify the shared objectives and expectations in the context of NPP-SOL.

Step 3. To define the priorities for each local hub and data collection.

### 4.2.2 A preliminary work plan

A preliminary work plan is designed to achieve the work package goals and implement steps. Below are i) a foreseen 2024 year's planned activities to boost the SHR HUB creation, common to all NPP-SOL partners, SE and researchers and ii) a proposed and initial work plan to develop for each case study. Leveraging the existing information, we intend to present, discuss and co-define such plans in the upcoming meeting involving partners, SE and researchers.

The planned activities aim to achieve two primary objectives:

- Progressing the establishment of the NPP-SOL SHR HUB
- Fostering active involvement of local hub members in key NPP-SOL project activities.

| Description | Starting Date | Ending Date | Jan-24 | Feb-24 | Mar-24 | Apr-24 | May-24 | Jun-24 | Jul-24 | Aug-24 | Sep-24 | Oct-24 | Nov-24 | Dec-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SHR HUB activities** | **Jan-24** | **Dec-24** | | | | | | | | | | | | |
| Establishment of the SHR Board | Jan-24 | Mar-24 | | | | | | | | | | | | |
| Establishment of the SHR Local Hubs | Jan-24 | Apr-24 | | | | | | | | | | | | |
| Deliverable 1.1 Updating | Jan-24 | Sep-24 | | | | | | | | | | | | |
| 1° SHR HUB General Assembly | Oct-24 | Dec-24 | | | | | | | | | | | | |
| Partecipation at scientific NPP-SOL tasks (To be defined, more detail in *NPP-SOL Tasks in which the SHR Local Hub participants should actively be engaged* ) | Jan-24 | | | | | | | | | | | | | |
| Co-design and partecipation at awareness and capactiy building sessions (To be defined) | Jan-24 | | | | | | | | | | | | | |

*Figure 4. GANTT Chart detailing the SHR HUB 2024 year's planned activities*

A remote meeting with NPP-SOL partners, SE and researchers will be organized following the publication of the first version of D1.1 (Winter 2024). The goal is establishing the SHR HUB Board and SHR local hub group.

A physical meeting in each case study will be arranged at each location to draft a site-specific work plan collaboratively. Using the methodology outlined in 4.2.1, these meetings aim to identify and initiate the definition of crucial aspects at the local hub's level:

a. challenges, objectives and KPIs

b. involvement in the NPP-SOL activities on site

c. knowledge gaps and training need relevant to implement the activities at the local level

Furthermore, within the Italian case study, we anticipate the implementation of pilot activities aimed to i) assess the existing knowledge and competencies on EU funds and projects, ii) analyse and evaluate past and current European-funded projects implemented by the partners and SE, and iii) strengthen the identification of knowledge gaps and training requirements on European drafting and management.

Engaging the key SHR local hub's actors in the ongoing project activities is crucial. Table 7 depicts NPP-SOL ongoing activities requiring input from the local hubs' participants to improve definition and implementation. Some of these activities have already started, others will begin in the first half of 2024. Table 8 shows instead the project activities that will begin in the second half of 2024, identified as those where the involvement of local hubs might bring added value.

Scheduled meetings with partners and local hub participants will cover discussions on methods and timing of engagement in such project activities. It's crucial to actively encourage meetings with project partners to emphasize the significance of this involvement right from the outset.

Table 7. Main tasks in which the local hub participants should actively be engaged moving forward

| Work packages | Tasks | Activities | Lead partner | Start and end date |
|---|---|---|---|---|
| WP2 | Task 2.1 | BR in Italy, Morocco and Israel | UNIBAS | M1-M15 |
| | Task 2.2 | CW in Spain | UB | M1-M15 |
| | Task 2.3. | AD in Israel | ARO | M1-M15 |
| WP3 | Task 3.1. | Preliminary characterization of the Case Study Sites, to identify the main NPS pollutants (Pollutant Sources Analysis - PSA) | UNICA | M2-M12 |
| WP4 | Task 4.1. | Integrating FLOWS-HAGES and DAHBSIM for simulations at field scale | UNIBAS | M1-M6 |
| | Task 4.2. | Using the MT to support development of SSBMP | UNIBAS | M6-M24 |
| | Task 4.3. | Using the MT to support designing of PPT | UNIBAS | M6-M12 |
| | Task 4.4. | Elaboration and structuration of household farming systems and agro-hydrological use database | IAMM | M1-M18 |
| | Task 4.5. | Development, parameterization and use of integrated DAHBSIM and FLOWS-HAGES models for testing scenarios | UNIBAS | M6-M36 |
| WP5 | Task 5.1. | The outward strategy | IAMM | M1-M6 |
| | Task 5.3. | Communication activities | IAMM | M1-M36 |

Table 8. Main tasks in which the local hub participants should actively be engaged

| Work packages | Tasks | Activities | Lead partner | Start and end date |
|---|---|---|---|---|
| WP3 | Task 3.2. | BR in Italy, Morocco and Israel | UM5 | M10-M24 |
| | Task 3.3. | CW in Spain | UB | M10-M24 |
| | Task 3.4. | AD in Israel | ARO | M10-M24 |
| WP5 | Task 5.2. | Upscaling, transferability and exploitation | MOAG | M24-M36 |
| | Task 5.4. | Technical Capacity Building and Farmers Awareness | IAMM | M18-M34 |

After a year into the project, in autumn 2024, the inaugural General Assembly (GA) will be convened. This occasion will be pivotal for fine-tuning local hubs' objectives, KPIs, and work plans. A participatory monitoring process will be set up to review priorities and devise actions accordingly, and an update of the D1.1 will be provided. A virtual meeting with each Local Hub will follow the GA proceedings between late 2024 and early 2025, while another in-person meeting is planned for the spring-summer of 2025 for each case study.

Such meetings will aim to:

a) stimulate SHR local hub participation in NPP-SOL activities

b) assess progress towards achievement of identified local objectives

c) follow up on the participatory data collection and monitoring process at the local level

d) update and adapt work and monitoring plan

e) discuss and identify solutions to challenges and constraints at the hub level

Furthermore, the meeting will present an opportunity for the Italian case study to undergo a training session on European project design. The objectives of this session will be twofold: i) Providing knowledge on European design tools and methodologies relevant to the local context and involved institutions ii) Co-designing new project proposals with hands-on traditional European tools and innovative and participative design methods.

Two GANTT Charts focused on local sites to summarise the information given so far.

• A GANTT details the Italian case study, having already met critical stakeholders within the NPP-SOL project.

• A GANTT plan presents the same activities, slightly delayed for the other three local hubs: Israel, Morocco and Spain.

The outlined project activities are scheduled for implementation in the case study areas starting January 2024. The forecast extends until August 2025 but is subject to adjustments and modifications. It will be necessary to define the details of these plans per case study jointly.

| Description | Starting Date | Ending Date |
|---|---|---|
| **Italian Local Hub** | **Jan-24** | **Jun-25** |
| Remote meeting with SE and Researchers designated by the project partners | Jan-24 | Feb-24 |
| Physical meeting (Focus group & Experimental meeting to see the NPP-SOL process) | Apr-24 | Jun-24 |
| Remote meeting with Italian Local Hub following the 1° General Assembly | Nov-24 | Mar-25 |
| Physical meeting (Workshop & Experimental meeting to test the NPP-SOL results) | Apr-25 | Jun-25 |
| Partecipation at Task 4.4 Elaboration and structuration of household farming systems and agro-hydrological use database | Jan-24 | Mar-25 |

*Figure 5. GANTT Chart Italian Local Hub Jan'24 – Aug '25*

| Description | Starting Date | Ending Date |
|---|---|---|
| **Israel, Spain and Morocco Local Hub** | **Jan-24** | **Aug-25** |
| Remote meeting with SE and Researchers designated by the project partners | Jan-24 | Feb-24 |
| Physical meeting (Focus group & Experimental meeting to see the NPP-SOL process) | Jun-24 | Aug-24 |
| Remote meeting separately with Israelian, Spanish and Moroccan Local Hub | Nov-24 | Mar-25 |
| Physical meeting (Workshop & Experimental meeting to test the NPP-SOL results) | Jun-25 | Aug-25 |
| Partecipation at Task 4.4 Elaboration and structuration of household farming systems and agro-hydrological use database | Jun-24 | Aug-25 |

*Figure 6. GANTT Chart Israeli, Moroccan and Spanish Local Hub Jan'24 – Aug '25*

### 4.2.3 SHR Board establishment

The establishment of a board typically involves several steps. The composition has been presented during the KOM, and the ongoing activities implemented with partners and key stakeholders relate to defining the members who will serve on this board. The board establishment goes through the knowledge of potential key stakeholders and researchers to the project activities and the relevance of their presence within the four local hubs. We have already created a preliminary list of potential key stakeholders and researchers of the local hub for each case study area. Starting from these lists, the board members will be defined. We need to co-decide whether the board members will remain constant throughout the project or if there's a planned rotation. Both options have their advantages and disadvantages. Maintaining a consistent team throughout favours continuity and deep understanding. Encouraging rotations among the board members promotes a more democratic environment, infusing new energy. However, it also risks disrupting continuity in actions and decisions.

The primary function of the SHR board is to act as a sounding board of needs at the local level to the central SHR hub and beyond and vice versa; the board will serve as the focal viewpoint for the central SHR hub and its partners to relay communications to the local groups. The aim is to establish the NPP-SOL SHR board that accurately represents the four area case studies most fairly and equitably for spring 2024. To establish the SHR board and the participants in the local hub group, the individuals listed by their respective partners in the preliminary lists will be surveyed. Based on specific criteria, this survey aims firstly to enhance understanding of the participants in the local hubs, identify those who might emerge as more representative than others, and be part of the board. To conduct this survey, we will follow the work performed by researchers as our reference Deliverable 7.1 Guidelines for the Selection of Multi-Actor Platform (MAP) Members (UNISECO project).

Criteria such as:

- Interest
- Availability
- Commitment
- Relevance
- Appropriateness
- Representativeness

The development of a datasheet for each participant will follow this. The NPP-SOL initiative seeks to engage diverse participants from agricultural advisory services, government policy, agribusiness, academia and research institutes. The selection criteria will guide enrolling individuals or entities. Members of these local hubs have the freedom to interrupt their engagement at any time, with the assurance that their data will be handled under the ethical guidelines and health and safety protocols in line with national and European laws.

## Conclusion

The main purpose of this document is to propose a settlement document of the SHR, including a detailed work plan of the SHR with activities and related procedures.

In the three months since the beginning of the project, a methodology was determined, and a first work plan was prepared based on the information received from the project partners. In addition, a local hub identity has been designed for NPP-SOL local hubs, and local hubs' identities will continue to be developed in cooperation with project partners and stakeholders. The next step will be to present the methodology and work plans to the project partners, looking forfor their validation and carried out the planned activities with the stakeholders.

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