the LENSES project

LEarning and action alliances for NexuS EnvironmentS in an uncertain future

LENSES

WP2

D2.2 Activity of the LENSES Learning and Action Alliances (LAAs) - progress report.

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Project coordinator

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Project Website

www.lenses-prima.eu/

Project partners

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Executive summary

This report is intended to describe the activities carried out within the “Learning Action Alliances” at three scales in which they operate (pilot, project and trans-project) by Month 24.

As an introduction, it presents the concept of **Learning and Action Alliances (LAA)**, in general and within the framework of the LENSES project (LEarning and action alliances for NexuS EnvironmentS in an uncertain future) and how they are articulated at their different scales and levels. The methodology to design and monitor the **implementation roadmap** and the planning of participatory activities to be undertaken by the seven pilots is also described.

For the LENSES pilot-LAAs, the document also summarises the **conducted activities and the lessons learned** so far. The document highlights some reflections from the pilot's experience during these months and the strategies developed by the LAAs in order to face the challenges they have been able to identify during the ongoing stakeholder engagement process.

The report also presents the activities carried out during the **project LAA meetings**, the subjects that were discussed and how these activities created a space for dialogue, trust and exchanges between pilot leaders as well as between pilots and work packages (WP).

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1. Introduction

Boosting the **integrated management of the Water-Ecosystems-Food-Climate (WEFC) Nexus** has long been recognized as a critical challenge that requires the cooperation and coordination of stakeholders at multiple levels. However, this challenge has been compounded by the impact of the climate change crisis, which has led to more complex, uncertain and interconnected trade-offs and conflicts. The lack of **communication, coordination, and dialogue between WEFC Nexus-related stakeholders** is one of the main barriers to effective management of the Nexus. This has led to todays' deep-rooted problems, such as institutional fragmentation, silo thinking and acting, and recognises the need for more transversal approaches to nexus management.

In response to these challenges, the LENSES project aims to **place stakeholders at the centre** of any approach to explore, understand, and tackle nexus trade-offs, related conflicts, and management challenges. This approach recognizes that stakeholders' behaviours, contexts, expectations, and actions are key elements for change. In fact, shifting stakeholder behaviour is the channel through which resilient nexus management may occur.

One of the key ways in which LENSES operationalizes stakeholder involvement is through **Learning and Action Alliances (LAAs)**. These discussion-and-action groups are composed of a broad selection of stakeholders who convene through a structured series of workshops, participatory activities, and discussion meetings with the aim of creating communities in which learning resulting from project activities and outputs is directly translated into real action by the affected actors. The LAAs are a dynamic learning process and a living collective body that is expected to evolve by trust building among partners and common achievements.

LENSES' focus on "**social learning"** is a central element in facilitating nexus thinking and driving resilient nexus doing. *Social learning* is a process supporting a broad range of organisations that frame and reframe the issues at stake in one or several domains and develop enhanced capabilities to deal with common problems which individuals or one single organisation often cannot resolve on their own. Learning and Action Alliances (LAAs) allow for the operationalisation of social learning by building long-term relationships between participants based on **co-producing knowledge**, cooperating in the convergence of ideas, and exchanging knowledge within and between LAAs. The LAAs are made up of actors from various backgrounds, fields, and expertise with the common goal of contributing to the identification and development of solutions and facilitating their local adoption.

The LENSES LAAs also build on the idea of **"learning by doing"** and co-development rather than transfer of knowledge through joint learning where there are no established experts. The ultimate objective it pursues is to achieve **mutual ownership which could increase adaptive capacity and governance,** and facilitate the identification and adoption of innovative solutions for complex socio-technical problems.

The LAAs are organised at three levels in the LENSES project, the pilot level, the intra-project level, and the trans-project level:

a. **At the pilot level**, co-development, knowledge sharing, and dialogue will be strengthened through a series of visioning exercises for the development of LENSES strategic roadmaps. The pilot LAAs are

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also the environment within which the System Dynamics Models and visioning approaches are developed, and Ecosystem-based Adaptation is planned.

b. **An intra-project LAA** will promote mutual learning across the pilot LAAs and address transversal themes, work in progress, and transferability.
c. **Finally, a trans-project LAA** initiative will facilitate exchanges with other sister projects funded under the same topic, as well as in related calls in PRIMA and other programs.

In summary, the use of LAAs in LENSES is expected to facilitate the development of a shared understanding of the complex WEFE Nexus issues among stakeholders, enhance their capacity to deal with these issues and contribute to the development of more resilient and sustainable solutions. By placing stakeholders at the centre of the approach, LENSES aims to overcome the challenges of communication, coordination and dialogue between WEF Nexus related stakeholders and promote a truly interdisciplinary and transdisciplinary approach to WEF Nexus management.

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2. Methodology of the Learning and Action Alliances (LAAs)

The LENSES project is a collaborative effort aimed at developing innovative and sustainable strategies in seven different pilot areas across the Mediterranean. Because the project relies heavily on stakeholder participation, which is seen as essential to ensure that the proposed strategies meet the needs and expectations of local communities and other key actors, in order to facilitate stakeholder engagement, the LENSES project has developed a methodology for the implementation of participatory activities in each pilot area.

The methodology was developed over the course of the first year of the project (see **D2.1. "Stakeholder engagement guidelines"**), through a series of participatory activities that involved pilot leaders, as well as WP2 and WP8. The objective was to create a framework for the allocation of participatory workshops, engagement, and dissemination activities in each pilot area. A generic allocation was initially proposed and discussed with pilot leaders (Figure 1), which was then adapted to the specific aim of each pilot depending on the different focus given to the development of system dynamic modelling, application of visioning or integration of ecosystem-based approaches into the recommended packages of solutions, development of business models for Nature-based Solutions (NbS), and so on. The participatory activities were then broken down into workshops involving the participation of the broad group of stakeholders, as well as other side activities where smaller groups of actors could convene to deal with specific topics more closely related to their expertise.

The next step was for each pilot to have customised their own pilot **implementation roadmap of participatory activities**. In order to support the pilot teams in the implementation of the participatory activities, WP2 and WP8 leaders prepared generic boards in Miro software (Figure 2), which were presented and validated through individual follow-up sessions with each pilot team. These templates allowed for pilot team members to collaboratively allocate participatory activities in a logical framework, accounting for the type of activity and the phase of the project (*preparatory phase, problem framing, assessment of nexus solutions, validation and action planning, capacity building and knowledge exchange*), the goals of such activity, the needed inputs, expected outcomes, and relation to other activities along a timeline.

The application of the methodology involved three steps. The first step was to choose the participatory activities that were going to take place in the pilots. This involved mapping out engagements in the form of workshops, interviews, focus groups, or any other activity where stakeholders were involved. The second step was to place each participatory activity along the timeline, along with any other activities that were being developed by the scientific team. This allowed for a clear visualisation of the workflow and expected outcomes by the end of the process. The third and final step was to build a pilot narrative that would enable pilot leaders to pitch their activities in LENSES dissemination activities in a simple, direct, and engaging way to stakeholders. In line with LENSES Grant Agreement (GA) ("The Activity of LENSES LAAs will be reported in D2.2 using a blog format"), in addition to the pilot roadmaps, a written section using a blog format has been included, and it is expected to be published in various platforms, such as the LENSES website and learning platform.

The results of this exercise are described in the next section, broken down by pilot area, with a specific focus on participatory activities. Overall, the methodology developed by the LENSES project is expected to

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contribute significantly to Nexus actions by involving stakeholders at every step of the process. This approach is expected to help build a sense of ownership and responsibility for the proposed strategies, which is critical to their long-term success.

Figure 1. Tentative timeline and content for the five pilots' Regional Meetings.

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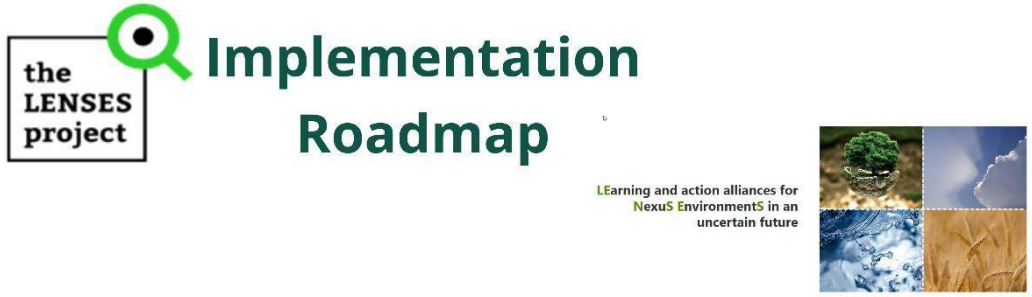

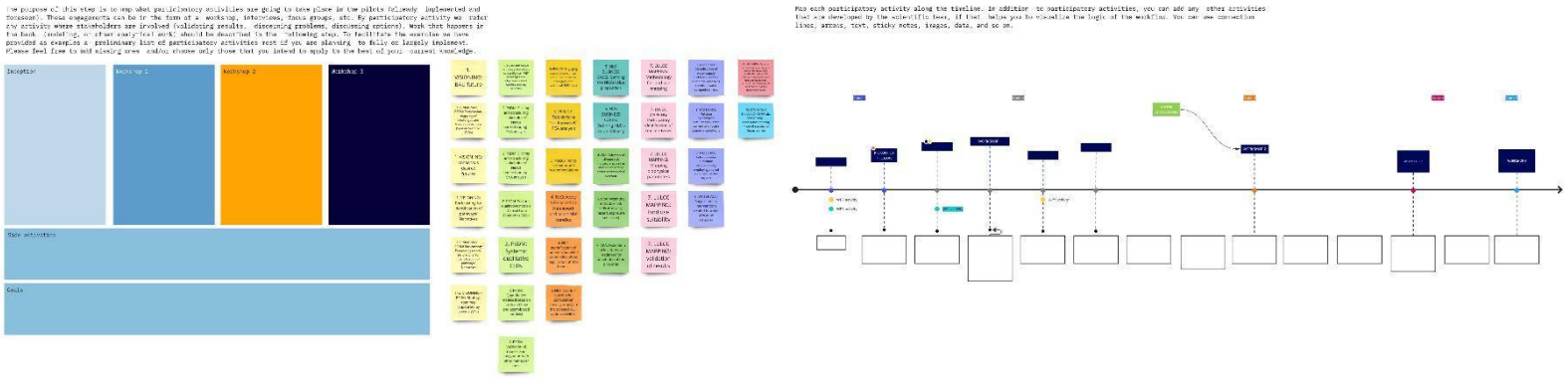

Figure 2. Initial template provided for the creation of the pilot implementation roadmap.

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3. Progress of the Learning and Action Alliances (LAAs)

3.1. Pilot LAAs: status of the implementation of participatory activities

3.1.1. Deir Alla (Jordan)

The pilot is testing the use of unconventional water resources, such as wastewater and saline water, as an innovative solution to address food production challenges related to the Nexus. The scarcity of freshwater resources, the high demand for water in agriculture, and the negative impacts of climate change are some of the main challenges that the pilot aims to tackle.

The main objective of conducting this study is to evaluate the cultivation of Alfalfa crop which consumes high amounts of irrigation water. This will be in comparison with the use of crop rotations of both summer and winter crops in terms of water saving, economic and environmental aspects. The aim is to propose a new formulation for animal feed, demonstrate the value of intercropping and what would be the right management of it to be an effective alternative to alfalfa crops, using less water and producing good quality animal feed.

Field activities

The pilot activities conducted in the Jordan Valley involved observing vegetable crops from December until the late of May and early June, and summer field crops such as corn and okra from April to the end of August. Date palms were observed throughout the year with the production season from August to October, while citrus could be seen all year round, with the production season from October to December. The pilot also involved silage making, where all plots were harvested and chopped using a drive shaft chopper before being mixed separately and compressed using a hydraulic compressor in plastic barrels for silage making. Molasses was added during the compressing process as a source of fermentable carbohydrate for bacteria. After 45 days, samples were collected from each treatment and analysed using both proximate analysis and NIR technology. Proximate analysis included moisture, ash, crude protein, neutral detergent fibre, acid detergent fibre, and ether extract. Data was collected to measure biomass produced for each forage plot to evaluate economic value. Different proportions of intercropped silage were made in plastic barrels to ensile the mixed crop. Finally, preparation was made for winter crops, with barley replacing sesbania and vetch replacing sorghum to ensure crop rotation for the 2022/2023 winter season. The main findings from the experiments indicated that silage quality would be evaluated at NARC Lab, and results would be available soon. Additionally, water and soil analyses were conducted, with mixed water from King Talal Dam being used for irrigation, and soil nutritional analysis showing good fertility levels but moderate salinity. Sorghum productivity under pilot conditions was 125-ton green forage per hectare, while Sesbania productivity was 48-ton of green forage per hectare.

Participatory activities

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Several stakeholder activities have been conducted in each season. During the first winter season, a technical workshop was held in order to demonstrate the reduction costs of feed to cattle hoarders. While conducting analysis from the first silage production and after planting the second season of Barley and Vetch, there were demonstrations of sillage management practices. The pilot team members presented alternatives to, especially, alfalfa crops which use less water and produce good quality silage. There has also been organised visits during the growth period, as means to disseminate the pilot activities (Figure X). It is expected that during this season another participatory activity will be organised as means to showcase the methods of silage production to local goat and sheep breeders.

In the upcoming season, two workshops are scheduled. The expected silage data results from winter and summer crops will be a direct input to this workshop, as well as a cost-benefit analysis which aims to demonstrate the value of intercropping and what would be the right management of this practice. It is expected that participants will include farmers and the Water Society of Jordan Valley, among other relevant stakeholders. The second workshop will be intended as a second part especially for farmers, and it will consist of a technical “training” workshop to a smaller number of stakeholders.

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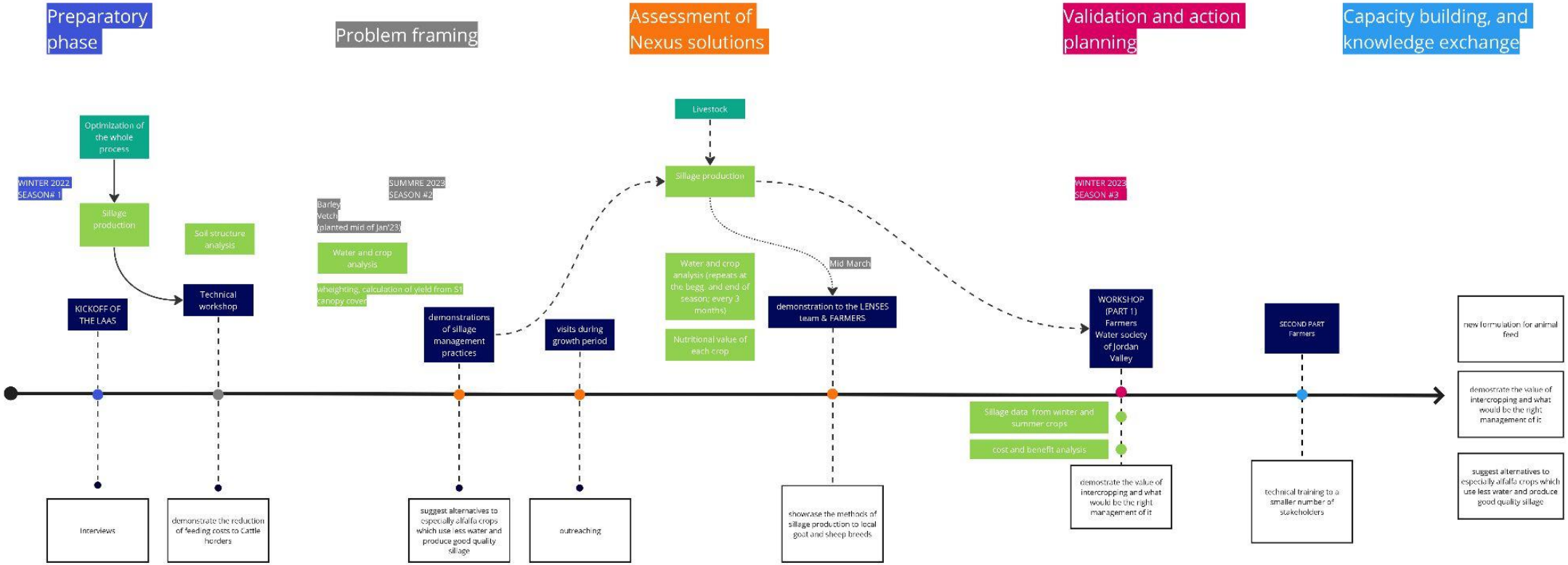

Figure 3. Deir Alla implementation roadmap. Available at: https://miro.com/app/board/uXjVPDnV21g=/?share_link_id=952899463872

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3.1.2. Hula Valley (Israel)

The Hula Valley pilot aims to assess the potential of agro-voltaic technology and nature-based solutions to address Nexus challenges. The challenges in this pilot are related to the limited availability of water resources and the need to increase the efficiency of water use in agriculture while maintaining ecosystem services, as well as governance issues. Regulations do not favour APV technologies as they are perceived as a potential risk to competing land uses, and expected to cause trade-offs between the agricultural and energy sectors. The pilot aims to address this challenge by helping farmers to diversify their livelihoods. The simulation of installing plastic sheets about the trees instead of the panels gave the team a good estimation on the effects when APV will be installed, but this has to be approved. If the regulation barriers the pilot is experiencing were solved, this approach allows for activities such as food and energy production to be compatible, while ensuring ecological benefits, such as saving water in orchards and enhancing biodiversity.

The main achievement of the Hula Valley Pilot was in proving the water saving potential by implementing APV in orchards, with minimal negative impact on the fruit production. The results achieved are good and the farmers were satisfied with the possibilities to implement APV in their orchards. The LENSES APV approach fully implemented at the Kineret Watershed will free about 15% irrigation water in orchard fields, to nature, achieving solutions to a basin-level WEFE nexus challenge.

Following there is a description of the **many meetings** the pilot team had with farmers, regulators, industrialists and managers at the Kibbutzim regarding the LENSES project and the results of the experiments done:

- **Pilot experimentation:** the APV methodology testing was done with two different APV companies in two different orchards, in Kibbutz in the valley and in another Kibbutz on the mountain.
- **Pilot dissemination:** Multiple meetings have taken place between the Netafim irrigation factory and the orchard manager at Yiftah to discuss the idea of implementing APV. Additionally, there have been several meetings held with the Economic CEO and delegates from Agri-Light panel's industries at Kibbutz Yiftah, as well as with officials from the Upper Galilee Regional Council to discuss the potential application of the proposed system to Galilee orchards.
- **Regulation barriers:** there are ongoing discussions with the office at the Department of physical planning at the Regional Authority.

In the upcoming stakeholder engagement activities, the goal will be to start an objective dialogue between the competing agents which are the Agriculture, Energy and Environment ministries of Israel. The idea will be to explore how intersectorial challenges are affecting the governance of the nexus, exploring the political and economic barriers to implementation.

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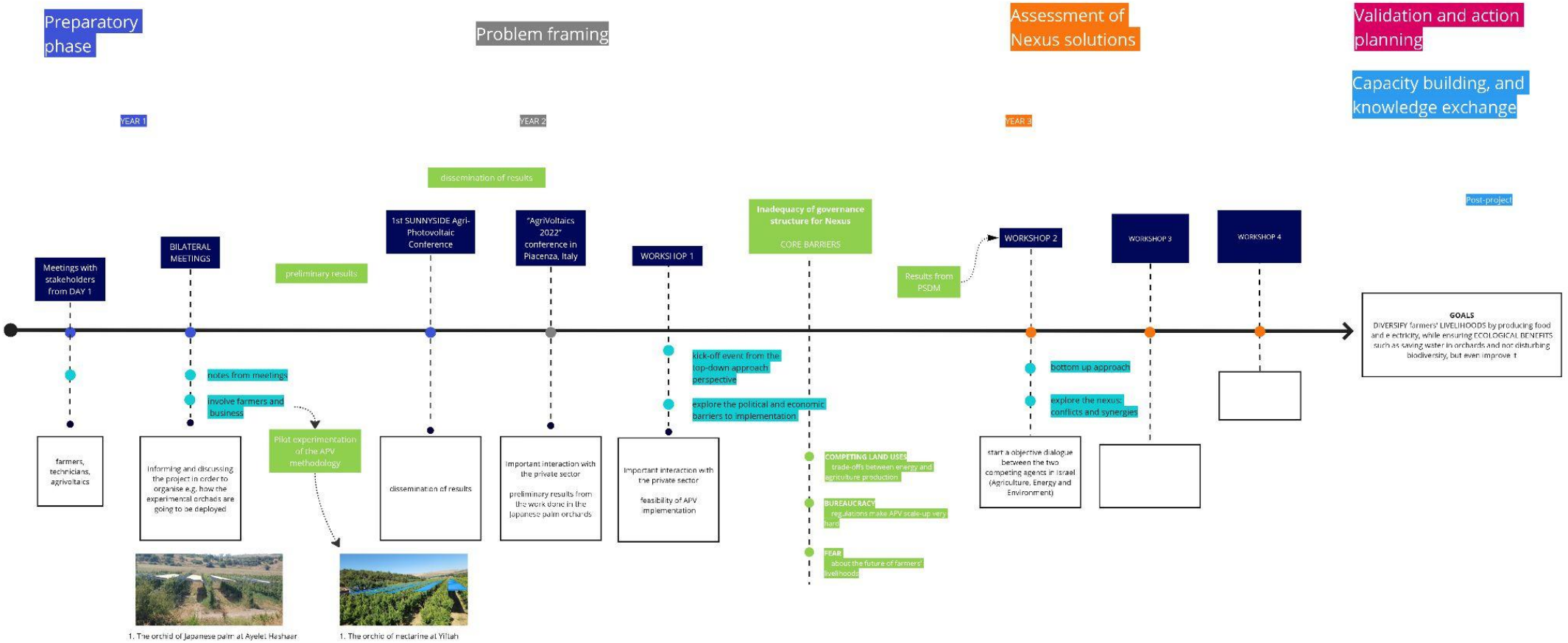

Figure 4. Figure 4. Hula Valley implementation roadmap. Available at: https://miro.com/app/board/uXjVPDnV2yw=/?share_link_id=332481284925

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3.1.3. Koiliaris River Basin (Greece)

The Koiliaris Critical Zone pilot in LENSES integrates field experiments aimed at reducing water demands in avocado crops with the assessment of NbS on water scenarios. The challenges in this pilot are related to the high-water demand of agriculture and the need to reduce the pressure on water resources in the region. Additionally, policy-related issues impact farmers' behaviour and do not favour the uptaking of agricultural practices aligned with the vision of NbS.

The pilot has a long history of engagement with the local avocado farmers association, around 17 years of collaboration. The focus with this group of stakeholders has been to develop a causal-loop diagram (CLD) which focuses on WEF impacts related to irrigation technology. At this stage, the CLD has reached a high level of detail in problem framing.

The first participatory activity consisted of a **focus group** in which farmers were discussing a vision of water resources availability in the area. The **visioning discussion** with avocado farmers from the Koiliaris Observatory took place on October 25, 2022. Due to its past history, the fragmentation of land into small parcels, the fact that most farmers had other jobs in addition to taking care of their farms, and low prices in agricultural products have led to decreases in agricultural productivity and profit. Today, the need for cooperation between farmers is seen as necessary to achieve sustainable economies of scale. The discussion focused on the effectiveness of current irrigation practices and potential strategies to overcome existing barriers to innovative practices. The CLD was also reviewed. Parallel to these discussions, **soil analysis and irrigation monitoring** is being carried out, accounting for soil structure, organic carbon, fertility, and biodiversity parameters.

Soon, WP4 will share a new CLD, and WP3 will also provide policy scenarios. In October 2023, another **focus group** will be held with expert stakeholders to **r**eview the CLD, and agronomists, independent consultants, and research institutes will be interviewed to verify the last version.

In September and October 2023, it is expected that the pilot will present data regarding the inputs from WP3, WP4, and the analysis of physical and biological samples to prove farmers with the benefits of adopting more ecologically sound practices. This **last workshop** will aim for training the avocado association and discussing the WEF nexus optimization.

Other participatory activities will include the Jordan Valley project meeting which will take place in early October, and the final meeting at a conference in Crete focused on "Story as a driver of change."

Overall, the aim of the pilot is to determine the benefits of optimising the WEF nexus by decreasing irrigation, increasing organic carbon, and improving soil structure and agricultural production. However, the team is not yet at the co-design stage, and potential farmer misadaptations are part of the problem. For the pilot, it is critical to understand what policy context would improve the uptaking of NbS. There is an underlying issue affecting farmers related to the Common Agricultural Policy (CAP) and the subsidies received. In that respect, the main difficulties the team faces relate to making an impact on farmers and policy makers' choices by showcasing the project results.

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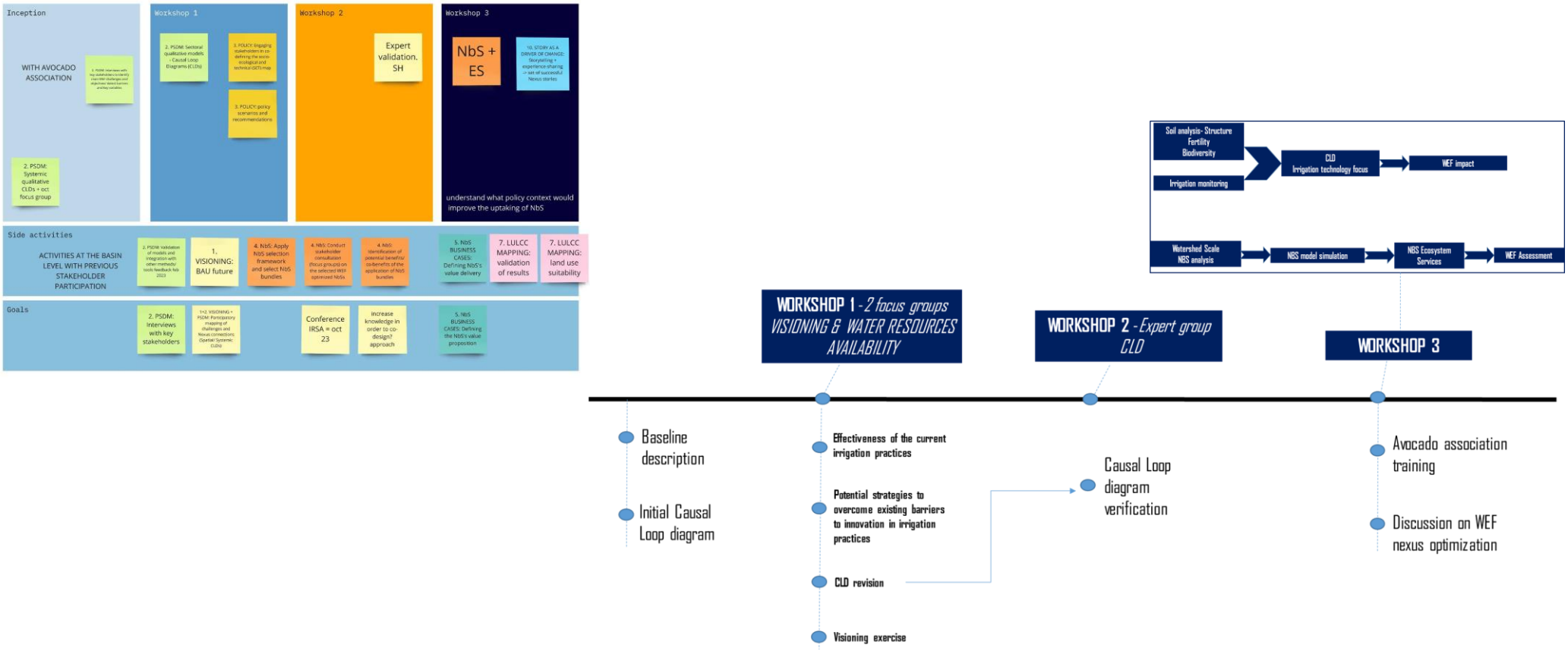


Figure 5. Koiliaris implementation roadmap. Available at: https://miro.com/app/board/uXjVPDnV29Q=/?share_link_id=509228689720

3.1.4. Pinios River Basin (Greece)

The Pinios pilot has conducted several participatory activities which the team members reported as of **high effort and very satisfactory**. This is because there is an excellent connection to local stakeholders. The LENSES tasks implemented so far include the LAA roadmap (Figure 6), the hydrological model, the NbS efficiency simulation and writing of publications. The SWAT model is implemented in Agia watershed (PHO) to quantify the hydrological processes, as well as the effects of agricultural practices. Irrigation and other practices are incorporated in the model after information from local farmers. SWAT and SEAWAT models are being currently updated in Pinios River Delta to quantify the hydrological processes and the effects of agricultural practices.

The **participatory activities** which have taken place already are the following:

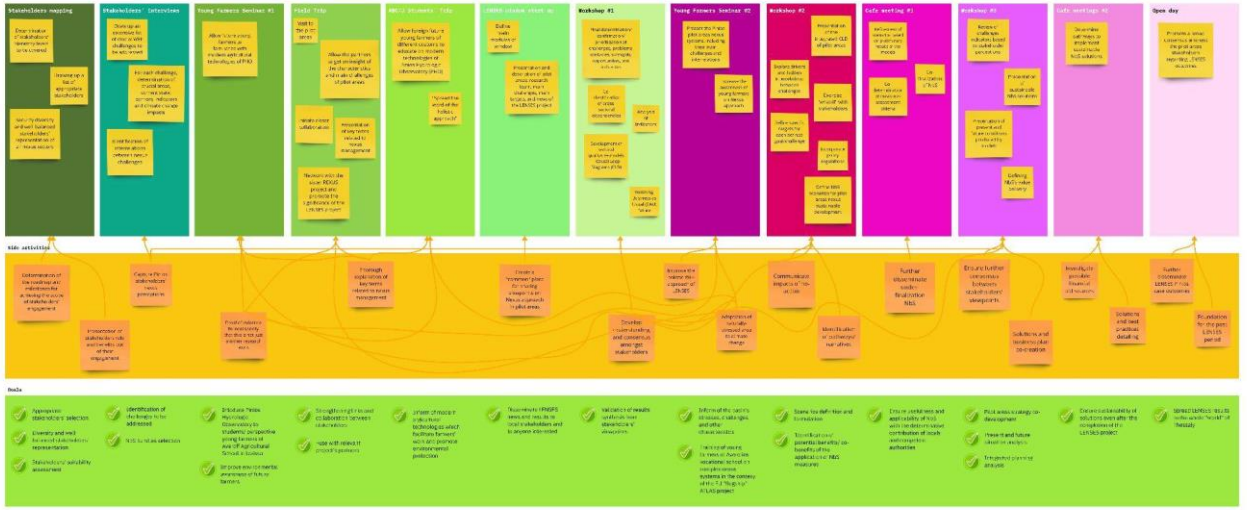
- **Stakeholders mapping and interviews**. Following D2.1 guidelines, the pilot determined stakeholders' hierarchy levels to be covered, drawing up a list of appropriate stakeholders. Then, they ensured a diversity and well-balanced stakeholders' representation of all nexus sectors and drew up an extensive list of crucial WEF challenges to be addressed. 19 Stakeholders were interviewed. For each challenge, the focus was on determining crucial areas, current state, barriers, indicators and climate change impacts, as well as the identification of interrelations between nexus challenges.
- **First young farmers' seminar.** The goal was to allow future young farmers to familiarise with modern agricultural technologies of Pinios Hydrological Observatory.
- **Field trip**. During the field trip, partners were able to visit the pilot areas and gain insight into their characteristics and main challenges. This visit helped to initiate closer collaboration among the partners. In addition, key terms related to nexus management were presented, and networking with the sister REXUS project was conducted to promote the significance of the LENSES project.
- **ABC/J Students' trip**. Aimed to educate foreign future young farmers from different cultures about modern technologies used in the Pinios Hydrologic Observatory (PHO) and spread the word about the holistic approach.
- **Lenses Window start up.** At the start of the Lenses Window, the main modules were defined. This includes a presentation and description of the pilot areas, research team, main challenges, main targets, and news about the LENSES project.
- **First workshop**. In the first workshop, the following actions were taken: the final determination, confirmation, and prioritisation of challenges, problems, obstacles, strengths, opportunities, and indicators; the co-identification of cross-sectoral dependencies; the analysis of indicators; the development of sectoral qualitative models, which involved creating Causal Loop Diagrams (CLD); and the visioning of a Business as Usual (BAU) future.
- **Second young farmers' seminar**. The second young farmers' seminar presented the nexus system of the Pinios pilot area, including their main challenges and interrelations. The seminar also aimed to increase the awareness of young farmers on the nexus approach.

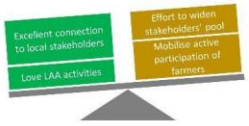
The **upcoming participatory activities** to be implemented until the end of the project:

- **Second workshop**. Scheduled to take place at the beginning of May 2023, and it will focus on developing what-if scenarios, the first part of the visioning exercise, and the use of NBS. During this workshop, the integrated CLD of pilot areas will be presented, and the drivers and hidden interrelations between challenges will be explored. The stakeholders will participate in the "what-if" exercise to define specific targets for each defined goal/challenge, incorporating policy regulations. The workshop will also define NbS scenarios for pilot areas nexus sustainable development.
- **Second young farmers' seminar**. It will take place at Averoff Agricultural Vocational School of Larissa to present Pinios pilot areas nexus systems, their main challenges and interrelations, and increase young farmers' awareness of Nexus approach.
- **Cafe meetings.**
    - First cafe: Intended to plan NbS assets and implementation, refine scenarios based on preliminary model results, co-finalize NbS, and co-determine assessment criteria for measures.
    - Second cafe: Assess and detail solutions and business plans, and determine pathways for implementing sustainable NbS solutions.
- **Third workshop**. The third workshop will focus on co-creating solutions and a business plan. It will involve a review of challenge indicators based on stakeholder perceptions, presentation of sustainable NbS solutions, presentation of present and future conditions produced by models, and defining NbS's value delivery.
- **Open day/ results' presentation event.** The Open Day/ Results Presentation event will lay the foundation for the post-LENSES period by promoting a broad consensus among stakeholders in the pilot areas regarding the outcomes of LENSES.

Nevertheless, more efforts to **widen the stakeholders' pool and to mobilise the active participation of farmers** are needed. One of the key challenges the pilot is facing regarding stakeholder engagement is that some stakeholders often view "scientists" as disconnected from their reality and not particularly useful. These efforts aim to demonstrate to stakeholders, particularly small farmers, that LENSES is not just another research project and that what "scientists do" is relevant and not disconnected from their "real" lifes. The pilot team members are working to promote the holistic approach of LENSES, especially to younger generations of farmers. The LENSES project's learning platform, LENSES window[1], is a crucial tool for engaging and educating farmers in NBS and relevant nexus sound practices. The platform aims to connect farmers with similar farmers from other Mediterranean regions. However, it is important to note that the language used in the LENSES project and in science in general can be difficult to communicate to farmers using an online platform that uses technical jargon.

[1] http://www.lenseswindow.eu/login/index.php





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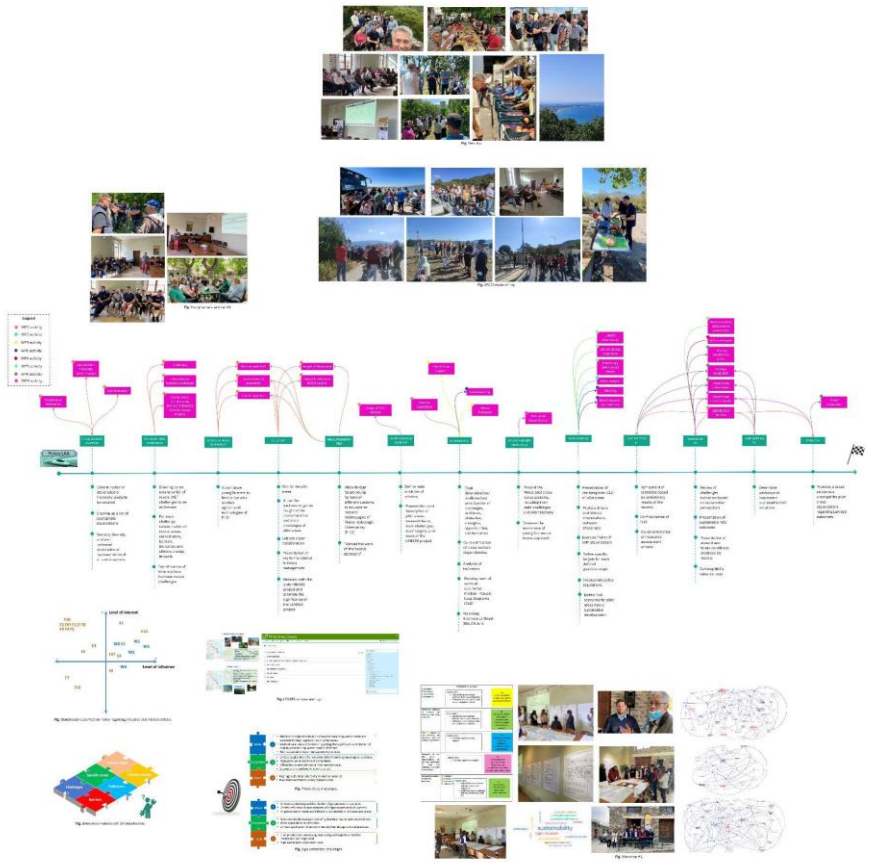

Figure 6. Pinios Implementation roadmap. Available at: https://miro.com/app/board/uXjVPDnV26M=/?share_link_id=190698705780

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3.1.5. Menemen Plain in Gediz basin (Turkey)

The Menemen plain is located within the Gediz basin in Turkey. This pilot project aims to develop an ecosystem-based basin management approach to ensure sustainable agriculture and food supply. The Nexus challenges in this pilot are related to efficiently managing water resources to meet the growing demand for agriculture and protect the Ecosystem Services (ES) provided by the Gediz basin. The demonstration and dissemination of nature-based solutions as well as the development of a green vision for the basin are the solutions provided by LENSES to this challenge.

Fieldwork activities involving sampling of groundwater and soil have been conducted, as well as several and ongoing participatory activities:

- The **first stakeholder meeting** was an introduction to the project for both policy makers and a small number of farmers. The main objective was to identify the main problems affecting the basin from the WEF perspective.
- The **second stakeholder meeting** focused on the farmers. Both the farmer version and policy maker version of the Causal Loop Diagram (CLD) were implemented, and a survey was conducted using a questionnaire for 30 farmers. The Participatory System Dynamics Modelling (PSDM) stakeholders' version and the PSDM experts' version were also compared.
- Due to the drought in the region, **theoretical and practical training sessions** were organised in Menemen for producers to learn about the efficient use of water in agricultural production. Demonstrative activities are being planned in the farmers' fields in three themes: 1) *increasing microbial fertilisers* to reduce the use of chemicals; 2) *intercropping* by planting legumes in orchards to improve soil quality and reduce the use of chemicals; and 3) demonstrating regenerative practices to the farmers. A schedule is currently being worked on.

The **third stakeholder meeting** is planned for October-November 2023. A visioning activity is being planned with more meetings to follow. The main outputs from the fieldwork will be the presented, as well as the experience of NBS activities in the farmers' fields, to build a green vision for the future of the basin.

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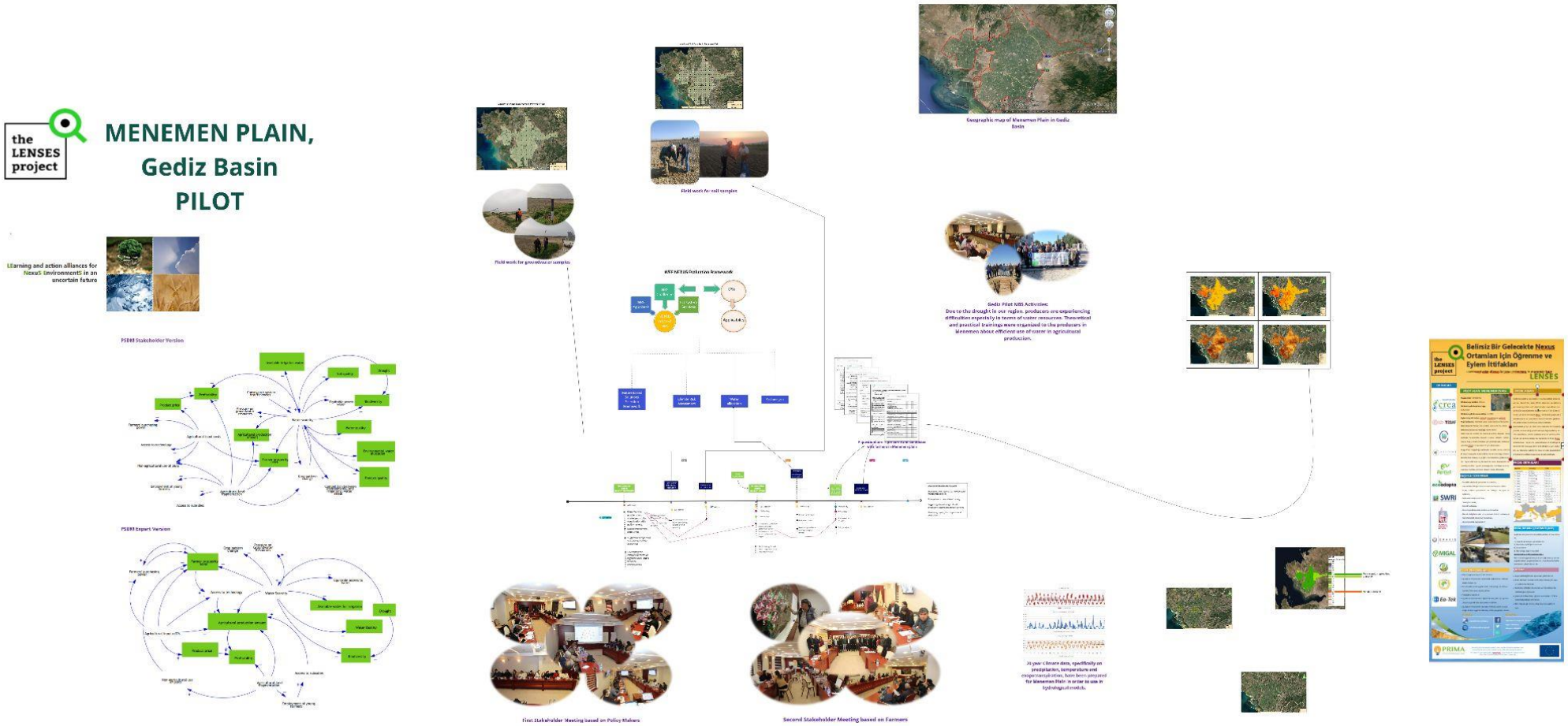

Figure 7. Menemen Implementation roadmap. Available at: https://miro.com/app/board/uXjVPDnV2_4=/

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3.1.6. Tarquinia Plain (Italy)

The main Nexus challenges in the Tarquinia Plain are related to the quantity and quality of water in agricultural areas. Also, there is a lack of collaboration sharing data between researchers and local authorities. There are well-intended basin management strategies in place, but they have not been fully implemented, as a result of institutional fragmentation.

Continuous contact has been made with stakeholders at various levels and timescales. As field experiments were not possible, data was collected from various databases. Most of the engagement was done in person or through conversations. The pilot faced the challenge of using official channels and online tools, which were slow and not suitable for effective engagement. Nevertheless, the pilot builds upon the previous FATIMA project in the area[2], which allowed for conducting a baseline analysis of key resources, actors and pressures aimed to engage stakeholder involvement in the project. More stakeholders were included using a snowball process, which led to **interviews** and the organisation of a **mini-workshop** online during the confinement period **(01/12/2021).** The workshop focused on the development PSDM method; additional PSDM interviews were conducted.

The **second workshop (26/05/2022)** consisted on the participatory mapping for the identification of nexus challenges, CLD validation and the first step of the visioning process (*problem framing*). This process has allowed the pilot team to develop the CLD for the study area and conduct analysis such as Social Network Analyses in order to gain understanding of the interrelations between key agents and resources underpinning nexus security.

The **third regional meeting** is scheduled to take place on **29/04/2023** with the objective of presenting and discussing the results of LENSES. The meeting aims to gain insight from stakeholder contributions and their points of view regarding the research. The visioning exercises for the regional meeting will be prepared between WP2 and WP3. Potential policy interventions will be identified to overcome the main barriers in the Tarquinia area and develop possible policy scenarios.

The WP4 team will present the results to stakeholders to obtain feedback on the analysis that will support scenarios and implement the stock and flow model. The results of these activities will be discussed with stakeholders. The hydrological model (SWAT) applied in the Tarquinia area will undergo final validation with CNR and EA-TEK to evaluate erosion and hydrology problems in the area.

For land-use sustainability evaluation, the AGRISAT team will be provided with support to collect new data for model validation and to evaluate the results of the analysis implemented in the Tarquinia pilot area. Finally, the DRAXIS team will evaluate the results of the climatic risk assessment study for the Tarquinia area.

[2] http://fatima-h2020.eu/pilots/italy-piana-di-tarquinia-lazio/

Figure 8. Tarquinia Implementation roadmap. Available at: https://miro.com/app/board/uXjVPXnqGBM=/?share_link_id=15920363103

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3.1.7. Doñana (Spain)

The Doñana pilot project is focused on **developing a strategic roadmap** to improve the management of the Water-Ecosystems-Food nexus, which is crucial due to the increased pressure of water resources overexploitation and climate change on regional resilience. The roadmap integrates visioning and PSDM methodologies as core elements, combining participatory methods with expert-based research. The roadmap elaboration will integrate other LENSES tools such as policy analysis, NbS bundles, and water accounting.

During the **first year** of the project, the study area was delineated, and the baseline description of the pilot was elaborated. Two bundles of NbS have been identified, and a time series of irrigated crops maps covering the full study area was produced. During November 2021, ECOADAPTA and IRSA conducted **semi-structured interviews** with key stakeholders to collect information on main sectoral challenges, key pressures, and existing impacts, among other things. The information was used to elaborate the socio-ecological network analysis and the Causal Loop Diagram (CLD), which are core inputs for the System Dynamics Model (SDM). Finally, the pilot implementation roadmap (Figure 9) allowed team members to map the participatory activities along with the LENSES methodologies to be applied in Doñana for the rest of the duration of the project.

The **first workshop** in the Doñana pilot took place in **October 2022**, organized by ECOADAPTA in collaboration with IRSA and Agrisat. Its focus was on validating the CLDs and discussing potential solutions to the main systemic challenges. The activity was based on the application of the participatory mapping methodology developed within WP2 and WP4, using maps and a set of cards depicting main resources, socio-economic activities, pressures, impacts and potential interventions. The items included in these cards come from the information gathered through the interviews. The focus of the workshop was to validate the CLDs, as well as deepen into the discussion on the elucidation of key Nexus challenges, i.e., moving from sectoral challenges into systemic challenges. Furthermore, the participants started the discussion on potential solutions to the main systemic challenges and provided meaningful information for the initial design of desired scenarios through a specific exercise using the Mentimeter tool. There was also time to introduce the progress of LENSES as well as the next steps in the participatory roadmap for the pilot to all the attendants.

The **second and third workshops** will occur in September-October 2023 and January 2024, respectively. This is because **Task 3.2, "Mapping and analysing political and policy context with policy makers",** will be tested during the previous months and will serve as an input for the workshops. This Political-Economic Analysis (PEA) will integrate the results from WP2 and WP4, especially the Social Network Analysis provided in **D3.1**, to understand the "business as usual" behaviours of stakeholders. This is expected to increase the saliency and relevance of the visioning exercises and implementation roadmaps resulting from the workshops.

The plan ahead goes as follows:

- First, the **PEA** methodology will be tested in Doñana using interviews and focus groups, to then apply a qualitative approach to analysis of the narratives from different stakeholders.

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- Once the results from PEA have been analysed, the **second workshop** will use a semi-quantitative approach to develop visions, pathways and narratives, using the PSDM simulations and the results provided by PEA.
- The **third workshop** will focus on the development of a strategic roadmap towards the desired future accounting for main barriers, opportunities, trade-offs and synergies. The final version of the PSDM will allow the validation of the feasibility of the roadmap, and the PEA will turn more realistic the assumptions made about stakeholders' roles and responsibilities implementing the action. This is expected to produce the **"strategic roadmap towards a resilient nexus system in Doñana region"**.
- Afterwards, there will be **dissemination** activities concerning the roadmap, including presentations of the strategic roadmap and LENSES in general, to relevant stakeholders.

For the upcoming months, synergies with other pilots doing the same process, such as Tarquinia and Gediz, are envisaged. Nevertheless, direct collaborations and exchanges have still not been carried out nor proposed by any of the pilots to Task 2.2.

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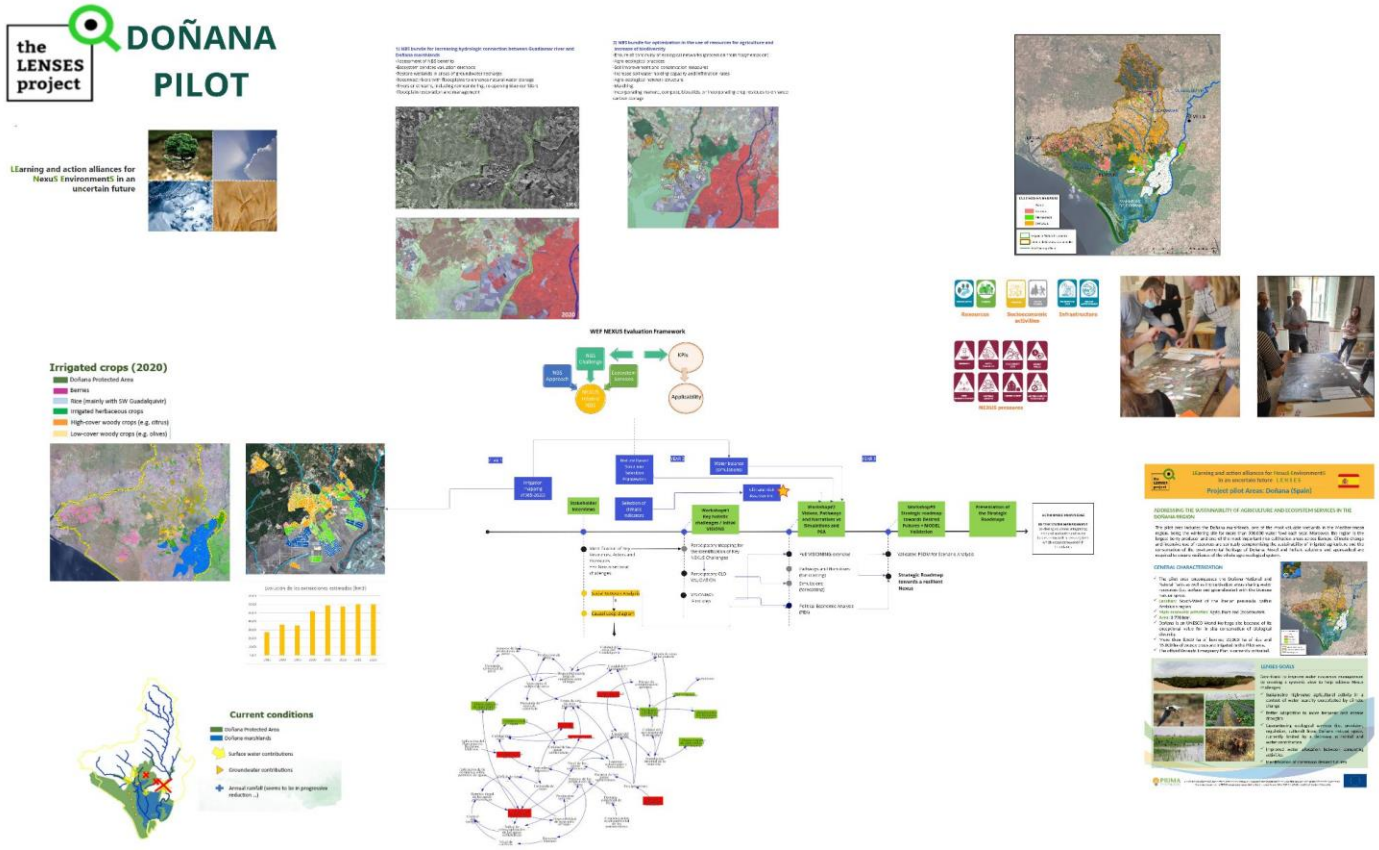

Figure 9. Doñana Implementation roadmap. Available at:
https://miro.com/app/board/uXjVP0LGgWY=/?share_link_id=829311231337

3.2. Project LAAs

The LAA project is an important aspect of the LAA approach. These meetings aim to facilitate knowledge exchange between LENSES pilots and technical work packages with a focus on mutual learning and cross-fertilization. This involves exchanging experiences regarding Nexus challenges, comparing innovative solutions to current sectoral approaches, and identifying barriers and drivers for the adoption of systemic solutions. This work is essential to highlight key transferability issues for the successful uptake of the solutions in a different context.

The project provides a space for discussion around transversal topics addressed by LENSES, and is facilitated by ECOADAPTA as leader of WP2. The LAA meetings are typically held virtually, with the occasional in-person meeting coinciding with larger project meetings. The LAA meetings are expected to continue on a monthly basis until the end of the project.

In conclusion, the LAA project plays a critical role in promoting knowledge exchange and facilitating collaboration between stakeholders in the LENSES project. With **recurring meetings** scheduled for the first Monday of every month from 10:00 to 11:00 CET, the project provides a platform for pilot-to-pilot meetings, WPs to pilot meetings, thematic sessions with key stakeholders, and even trans-LAA sessions. It is important to make the best out of these exchanges to learn from each other and capitalise on experiences from pilots and stakeholders. Additionally, as a group, it may be possible to collectively set the project-LAAs agenda and identify topics for discussion that are important to the LENSES project. Let's work together to make these meetings productive and valuable for all participants.

This subsection summarises the activities undertaken by the LAA project during the first 18 months of the LENSES project:

The **first project LAA** focused, as a first step, on the main aspects regarding the functioning of this LAA (i.e., what is the project LAA, who will participate in the meetings, what are the potential topics to be addressed, and how often, when and for how long will the project LAA convene) were presented, discussed and agreed between the pilot leaders. As a second step, ECOADAPTA produced a presentation on tips and key aspects to be considered and addressed for the organisation of a successful workshop.

During the next **project-LAA,** ECOADAPTA presented the generic structure for the realisation of a roadmap of participatory activities, where technical workshops and other dissemination workshops involving the broad group of stakeholders are assimilated to the Regional Meetings. Finally, the initial version of the guidelines for stakeholder engagement were presented, and questions related to the suggested approach for stakeholder mapping were answered back.

The **third and fourth project LAA** (Figure 10) focused on a recap of the stakeholder engagement process so far. SWRI presented the other pilots the design and results from the first technical workshop in the Pinios pilot, including the presentation of lessons learnt and tips to improve the organisation. ECOADAPTA prepared the following set of questions for pilots to reflect and engage in debate:

- *How would you describe the engagement until now: very satisfactory, good, difficult/can be improved?*
- *What are the greatest difficulties you have/are encountering in LAA building?*

- *What has worked well in your LAA building approach so far?*
- *What hasn't worked so good? Any ideas on what needs to be done to overcome existing barriers?*
- *Give a concrete example of how LENSES scientific approaches will be used by stakeholders*
- *Give a concrete example from your pilot area of how the LENSES approach (the project outcomes) will help address a basin-level WEFE Nexus challenge and change outcomes?*

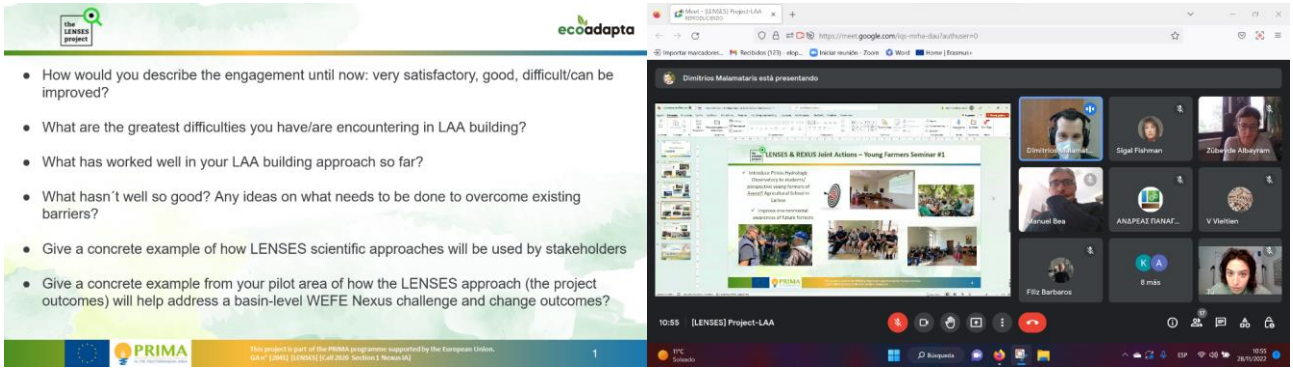

Figure 10. LAA Meeting (09/01/2023).

The **fifth project-LAA** took place on January 30th 2030 and focused on the D2.4 "Report on LENSES strategic roadmaps for Nexus Future". ECOADAPTA presented the core elements of the deliverable, including the practical steps for organising workshops 2 and 3 of the visioning process. ECOADAPTA also prepared Miro boards for pilots to answer questions regarding their interest in the visioning process, and to what extent they intend to apply it (Figure 11). This is meant to facilitate giving future support to pilots.

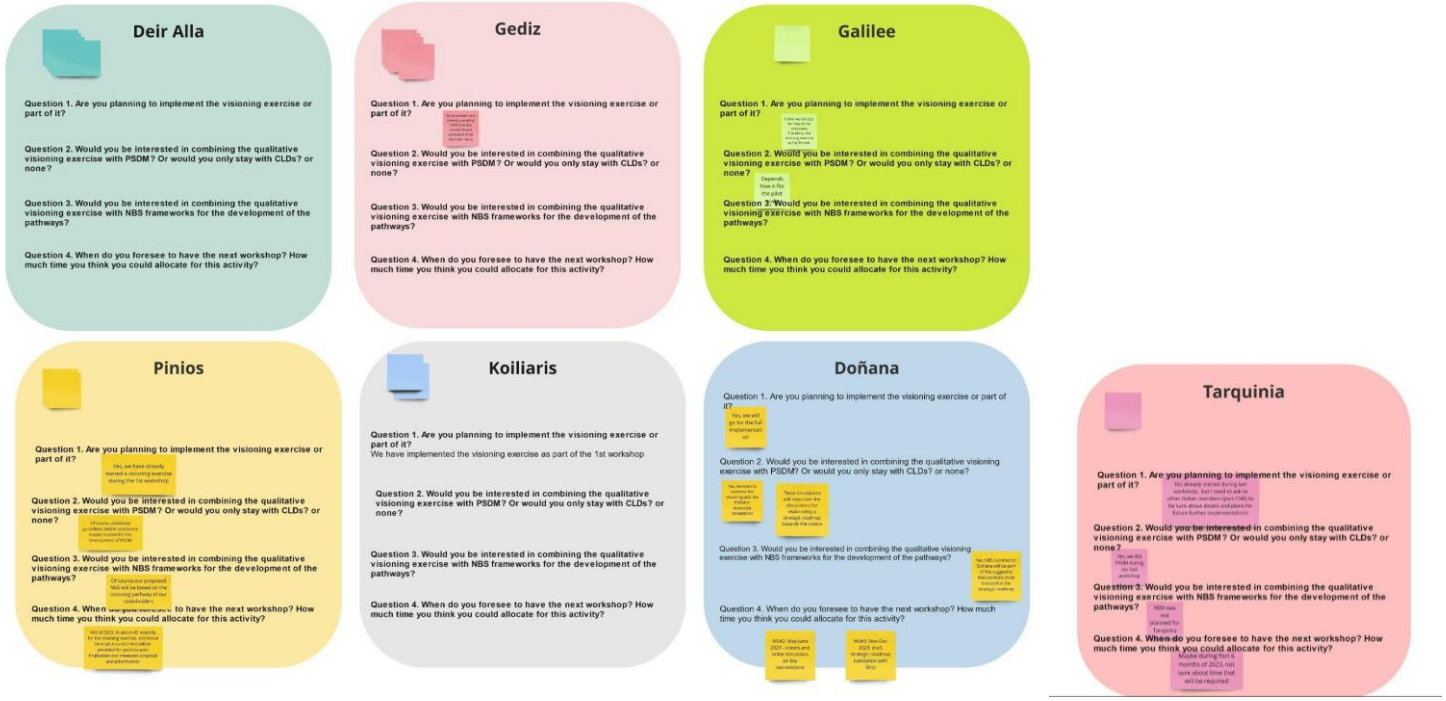

Figure 11. Planning for visioning participatory activities in LENSES pilots.

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During the **sixth project-LAA**, which took place on February 28th 2023, the University of Padova (UNIPD) colleagues provided an overview of the ecosystem services indicators and their development, with examples of implementation, describing the work done in **Task 6.1 "Socio-economic valuation on NBS: assessing ES"**. The session started with a short presentation of the methodology and the work done in Koiliaris pilot, making the aims of the indicators and the logic behind their development clear, as well as providing an overview of the indicators themselves and examples in terms of implementation. The focus of the remaining time was on clarifications and discussion, particularly on the identification of data availability at the pilot scale, which was identified as a bottleneck for the exercise. A Miro board was used to map the pilots' needs and goals (Figure 12). The second part of the meeting further clarified questions regarding mapping ecosystem services indicators and possible datasets that can be used for biophysical and economic quantification.

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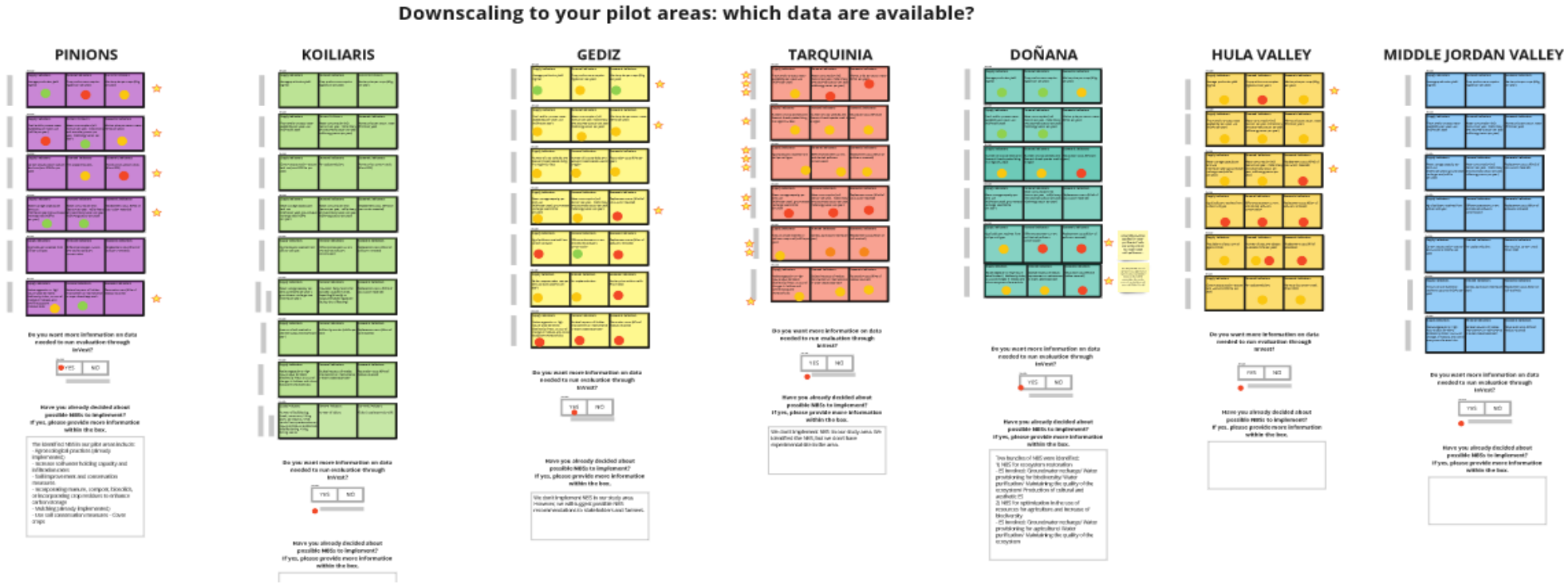

Figure 12. Planning for ES assessment in LENSES pilots.

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On March 27th 2023, the **last to date project LAA** focused on the learning platform LENSES window and its usability since its launch in June 2022. Since then, pilots were asked to log in the platform and designate a responsible person for updating its contents. The main questions discussed were about the platform's ability to enhance institutional and governance capacity, its usefulness in encouraging discussions between stakeholders, and its role in establishing a governance mode for implementation and monitoring of roadmaps. The conclusion was that some pilots find the platform relevant, while others doubt its engagement potential. It was also noted that some pilots are using the LENSES website and observatory, as well as their own social media channels, instead of the platform, which highlights the importance of collaboration between WP2 and WP9 regarding dissemination of pilot activities and producing contents.

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3.3. Trans-project LAAs

The **e-webinar** that took place on **January 18th, 2023** was the first **Nexus e-dialogues**, which aimed to share information and learnings about best practices in place across Mediterranean countries and beyond, to proactively address the complex risks driven by climate change. The experiences of Jordan and Israel pilots were presented, followed by lessons learned from the "diver-farming project" in Italy and agroforestry and intercropping experiences in Spain. There was a Q&A session and closing remarks.

There are **two upcoming webinars and one Nexus e-dialogues** planned. The first LENSES webinar is focused on sharing knowledge and lessons learned from the NbS and Water Management Pilot areas, Koiliaris (NbS) and Gediz (water management), targeting various stakeholders from decision makers to farmers and academic researchers.

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4. Conclusions and next steps

In conclusion, this report has provided an overview of the activities carried out within the Learning Action Alliances (LAAs) at different scales in the LENSES project up to Month 24. The report began by introducing the concept of LAAs and how they are structured within the LENSES project, along with the methodology used to design and monitor the implementation roadmap and plan participatory activities for the seven pilots.

For the LENSES pilot-LAAs, the report summarised the activities conducted, and lessons learned so far, including reflections on the challenges faced during stakeholder engagement and the strategies developed by the LAAs to overcome them.

The report also highlighted the activities carried out during project LAA meetings, which provided a space for dialogue, trust, and exchange between pilot leaders, as well as between pilots and work packages. Overall, the report demonstrates the effectiveness of the LAA approach in fostering collaboration and co-development of systemic solutions and provides valuable insights for future projects seeking to implement similar approaches.

So far, the LENSES LAAs have proven to be an effective approach for organising participatory activities in the three scales in which they operate. Stakeholders in all pilots are actively participating in fostering participatory activities, as means to foster co-design, and co-development of systemic Nexus solutions. Additionally, the LAA approach is crucial in identifying synergies between WP2 and other WPs. For example, WP2 and WP4 are actively collaborating to combine participatory mapping with the development of system dynamics models, and a similar collaboration was organised during one project-LAA for selecting NbS by the pilots. Also, regular and active interaction and exchange between pilots is occurring.

Although WP2 is coordinating the LAA activities, they work closely with 'Pilot implementation' through regular weekly meetings and joint elaboration of implementation roadmaps, as well as with WP7 on 'Pathways to impact' through joint activities aimed at amplifying implementation and dissemination of LENSES pilots. Developing links through the website and the learning platform has been identified as a key next step to increase the cohesion of the LAAs.

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