



# WP4. IMPROVE USE EFFICIENCY OF NON-CONVENTIONAL WATER IN AGRICULTURE

## LIVING LABS

### Implementation document

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الديوان الوطني للتخضير  
OFFICE NATIONAL DE L'ASSAINISSEMENT



con i bambini  
con le donne  
per i loro diritti

Junta  
de Andalucía  
Agencia de Medio Ambiente y  
Agua de Andalucía

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The 2014-2020 ENI CBC Mediterranean Sea Basin Programme is a multilateral Cross-Border Cooperation (CBC) initiative funded by the European Neighbourhood Instrument (ENI). The Programme objective is to foster fair, equitable and sustainable economic, social and territorial development, which may advance cross-border integration and valorise participating countries' territories and values. The following 13 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Tunisia. The Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French. For more information, please visit:

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The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

# LIVING LABS

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### **I- LIVING LABS: CONCEPT AND AIMS**

Living Labs are real-world test environments that address certain areas (thematic as well as spatial) and target groups for enabling joint developments of tools and services. Besides development processes, also awareness towards certain topics can be raised among different participant groups. Living Labs aim at pooling knowledge from as many (willing) participants as possible for generating best possible solutions respectively innovations.

The core element of every Living Lab is the network formed of public and private stakeholders who jointly develop and test new technological developments within the framework of an open innovation process (Wiederwald et al. 2017).

The adoption of innovations is critically built on processes of knowledge creation and learning. Knowledge creation was understood as a social process that transforms knowledge from the individual level into ever-wider communities of interaction. Individual learners contribute to knowledge creation by being connected to and participating in activities of social groups or communities. By doing so individuals also develop personal expertise through guided experience with experts or more advanced peers who help them to internalize knowledge that has been developed

The knowledge appropriation model connects these two discourses on knowledge creation and learning by defining knowledge creation practices that lead to the transformation and maturation of knowledge. Starting from individual experience, knowledge is shared in communities and further transformed into more mature knowledge that can guide learning and working.

Both knowledge creation and learning are based on common practices that ensure adoption of innovations are successful, sustained and scaled. We call these knowledge appropriation practices.

The basis of knowledge appropriation can be understood as a pattern matching and adaptation process, where patterns are created as solutions to some common problems in a domain, and later adapted to local circumstances:

- Create awareness: some new knowledge, new solutions or experiences that could be applicable in a particular situation are shared.
- Build shared understanding: This happens by negotiation and grounding between peers in scaffolding when they generate and maintain a shared understanding of the problem situation. In the knowledge maturation model, negotiation happens in an attempt to transfer or generalize particular knowledge to other contexts and is therefore a key process to lift knowledge to the next maturation stage.
- Adapt: Applying solutions to new situations requires some form of adaptation to the local context. This is a matter of de- and re-contextualizing knowledge and exploring which conditions can make the application successful and how the solution can be adapted.
- Validate: applying new solutions entails a certain amount of risk. The appropriation process therefore must establish some form of validation for a solution. This could

happen through gathering experiences, getting social support or approval or getting authorization from authorities. Validation may happen in informal discussions in a community, or by collecting formal evidence about the success and impact of a particular new method.

## **II- IMPORTANCE OF GENDER IN AGRICULTURAL PRODUCTION: WOMEN'S EMPOWERMENT**

In order to create a gender-responsive organizational environment, it is necessary to include a set of minimum standards for gender mainstreaming to ensure that gender dimensions are adequately addressed in LIVING LABS. It is important to understand women's engagement in both contributing family workers and being farmers on their own account; from being entrepreneurs running on- and off- farm business to being waged workers. Women's full contribution to agriculture is not always adequately captured in official statistics, as it is often unpaid. It is also important not to treat women as a homogeneous group and recognize that social dimensions other than gender, such as age or ethnicity can interplay to determine multiple forms of marginalization and exclusion.

It is important to give both men and women a voice as well as tailoring the events taking into account the heterogeneity and specificity of the community of users. Strengthening women's participation is crucial but it should be taken into account that participation alone might not be sufficient to ensure that women's needs and demands are effectively addressed and translated into action.

## **III- THE LIVING LABS UNDER MENAWARA:**

Using TWW as an input for agricultural production requires some adaptations both in the agricultural practices, the irrigation techniques, and the governance bodies. Moreover, social acceptability would limit its use. In this framework, Living Labs are an appropriate learning space that would open to the adoption of the technical innovation through a social innovation.

The demonstration fields of the target areas will be equipped with effective irrigation technologies and techniques adapted to the local context and tailored to the use of treated wastewater (TWW) which quality is enhanced according to the fit for purpose approach. The irrigation innovative trains adapted to TWW are identified in each intervention area together with the appropriate measuring and monitoring devices. The latter allow for the monitoring of soil water content and salinity levels, yield and quality of crops, and for the overall impact of the chain at demo-level and for simulating its up-scaling impact.

Accordingly, three momentum phases throughout MENAWARA lifespan can be foreseen. These phases shall lay the foundations for a sustainable learning space.

**MOMENTUM PHASE I: 2 Days Lab in each location for National Stakeholders**

The Debate:

- **Water allocation and cropping pattern for TWW reuse: water budgeting, irrigation techniques, legal, and governance dimensions.**
- **The state of the art of wastewater influent quality, fit-for-purpose treatment train, expected effluent quality and tailored use.**
- **Groundwater pollution by nitrates: possible solutions including FIA systems. (Arborea intervention area).**

The lab curriculum is based on the preparatory documents prepared by MENAWARA that paved the way for the implementation of the pilot actions and that considered all available studies and data (including legal and governance dimensions).

MOMENTUM PHASE II: 2 Days Lab in each location for National Stakeholders

The Pilot implementation:

- **Once the treatment train is operational, a demonstration of its efficiency and the reliability of effluent quality shall be performed (inspection test). The quality and reliability of the supply shall be considered together with the rules for allocation in compliance with equity principles among users and in response to the crops' requirements.**

The lab curriculum shall demonstrate the adequacy of the pilot in terms of actions and results to what was discussed and agreed upon in Lab.1 and shall be based on the executive documents of the pilots.

MOMENTUM PHASE III:

The Evaluation:

- **This Lab is supposed to integrate some stakeholders from different pilots in the same country and from different countries and incorporate results and impacts of at least 1 irrigation season. It is intended as a cross-fertilization activity that shall yield Lessons Learnt and Best Practices, these being the characteristics that differentiate a Living lab from a Pilot Action.**

The evaluation phase could coincide with the international roundtables expected to be implemented by each partner. The involvement of different stakeholders will be limited to the other PPs and associated partners unless the budget of each PPs allows to extend participation to other stakeholders. South-South exchanges addressed to farmers could also be organized during the same week in order to enlarge the audience including their perspectives.

The Lab curriculum shall be based on the evaluation process implemented in each pilot and the associated preliminary results.

#### **IV- THE LIVING LABS PROCEDURE AND MATERIAL:**

LLs are interactive and debate is essential. The animator shall introduce the concept and the problematics accounting for the heterogeneity of backgrounds and interests and keeping in mind the objective. This shall be followed by interactive exercises and arena debates well oriented and allowing all stakeholders to express thoughts and doubts with view of a final common agreement (specific focus groups should be organized to collect women's perspectives).

**Audio-visual material, open space sessions and well-structured debate arenas shall backbone each LL, in addition to evaluation sheets.**

The use the Women's Empowerment in Agriculture Index (WEAI) could be used to support assessing current women's empowerment, agency and inclusion within the agricultural sector and how it can be affected by the new technologies and practices. The WEAI can also be used more generally to assess the state of empowerment and gender parity in agriculture, to identify key areas in which empowerment needs to be strengthened, and to track progress over time. (<http://www.ifpri.org/publication/women's-empowerment-agriculture-index>)

A PROFESSIONAL ANIMATOR WHOSE INVOLVEMENT STARTS FROM THE PREPARATORY PHASE OF MATERIAL DEVELOPMENT AND LL ORGANIZATION AND EXTENDS TO MEETINGS ANIMATION AND REPORTS DRAFTING IS A NECESSARY CONDITION FOR THE SUCCESS OF THE LABS.

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