

D3.1

Criteria for Linking Existing Living Labs to the Case Studies

Disclaimer: This deliverable has not yet been approved by the European Commission and should be seen as draft!

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Executive Summary

Summary of Deliverable

Deliverable 3.1 "Criteria for linking existing Living Labs to the Case Studies" was developed within Task 3.4 –“Living Lab engagement”, led by NTNU, from Work Package 3 (WP3) “Involve and engage stakeholders”.

Purpose

This deliverable defines the first criteria for linking existing Living Labs to the ULTIMATE case studies. The outcome will be used to provide recommendations for WP3 to form new Living Labs based on the case studies resulting in a new type of Water Smart Industrial Symbiosis Living Labs (WSIS-LL) including an open innovation environment best suited for symbiosis with industry.

The outcome will be used to, to the extent possible, co-locate our engagement spaces in Task 3.3 with the WSIS-LLS to increase outreach and impact.

The report provides a review of the characteristics of a generic Living Labs from the literature as well as Water Europe`s criteria for Water-oriented Living Labs from their Atlas and a discussion on Water-oriented Living Labs challenges.

Method

We will identify existing Living Labs (LL) in the regions of the ULTIMATE cases by using the existing Water Europe LL inventory and provide the criteria derived from our WSIS-LL typology to work with them towards upgrading their status to WSIS-LLS.

Conclusion

This report has developed a preliminary list of criteria for linking CSs to LLs to transition towards WSIS-LLs and proposes a tailored approach through continuous evaluation to integrate the user-centric process design of Living Labs towards a WSIS-LL. In the design of the criterion, we considered Living Lab`s learning and collaborative processes and their outcomes, which requires openness of the environment: real-life structure, ICT infrastructure, and willingness of the participating actors to experiment, try new forms of play, take risk, and allow openness in collaboration, co-creation and learning- along with exploitation of existing resources, skills and competences. We also considered the issues of scaling up of the Water-Oriented Living Lab`s, particularly through the need for an enabling structure and environment that motivates stakeholders from various sectors and industries to commit and engage in the Water-Oriented Living Labs. Finally, we defined the following set of linking criteria between the Living Labs and Case Studies:





- **Community building and proper functioning**
- **User driven, open innovation methodology implementation**
- **Planning and collaboration outcomes**
- **Capacity building and transferability potential**
- **Iterative design of processes and organizational strategies**
- **Sustainability and social impact**

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1. Overview

This report aims to explore how the 9 ULTIMATE Case Studies might be assessed as potential new members of Water-oriented Living Labs. The recommendations are based on a literature review, the current European Network of Living Labs (ENoLL) and their evaluation criterion (Annex 1), and Water Europe's Water-oriented Living Labs (WOLLs). The report also aims to identify linking criteria needed between the Living Labs and Case Studies for water-oriented activities.

This report aims to explore how the ULTIMATE Case Studies might be assessed as potential new members of Water-oriented Living Labs. The results are built on literature reviews, the current efforts of the European Network of Living Lab (ENoLL), and the Water Europe's Water-oriented Living Labs (WOLLs). It also aims to identify complementary elements missing in current Living Labs linking criteria needed in Water-oriented activities.

According to ENoLL, a Living Lab involves four main activities: co-creation, exploration, experimentation and evaluation. ENoLL benchmark best practices among its members and increase the number of Living Labs through annual membership calls or "waves". Aspiring Living Labs have to pass about 80% of ENoLL's assessment criteria before joining the worldwide network of Living Labs.

Much attention has been given on the importance of innovation tools and methods within the Living Lab approach (Leminen & Westerlund, 2017). There have also been various studies on user engagement, stakeholder involvement, citizen co-creation and motivation to collaborate (Van Geenhuizen, 2018). However, there is less research to date on assessment criteria for a Living Lab and how to link them to potential Case Studies or innovation labs initiatives. Water Europe's Living Lab Atlas reported numerous Case Studies exist on Water-oriented Living Labs that are mostly related to more "sustainable" forms of production and consumption in use-context such as agricultural, urban, industrial, and ecosystem.

How can ULTIMATE's Case Studies evolve into sustainable Living Labs? What characterizes a Living Lab and how do such criteria ensure the sustainability of such an activity over the long term? Will the existing evaluation of ENoLL, complemented with the existing Water-Oriented Living Labs criterion help us define the linking criteria for sustainable WOLLs?

The first goal of this report is to better understand what characterizes a Living Lab. With the evaluation criteria defined by ENoLL, current literature, and the WOLLs Atlas, we hope to provide an insight on how ULTIMATE Case Studies can qualify as Living Labs.

The second goal is to understand if the actual evaluation criteria are enough not only to assess whether an initiative is a Living Lab or not, but also to assess the





sustainability of the Living Lab. In other words, we aim to answer the question: how can the selection criteria of existing Water-Oriented Living Labs complement and contribute to the sustainability of the Living Lab in practice?

Through such a more strategic assessment, Living Labs could better plan their activities and evaluate their processes to continue their operations over the long term. By considering evaluation criterion at the level of ENoLL and other initiatives and the linking criterion from existing WOLLs, we hope that such combined strategic approaches could be shared by Water-Oriented Living Labs in Europe starting from the ULTIMATE Case Studies, to remain in activity over the long term.

1.1. Structure of the Deliverable

In the section that follows, we briefly describe our methodology. In the next section, we provide an overview of existing evaluation criteria from existing literature aimed at adopting the Living Labs approach and place this in relation to the linking criterion from the Water-Oriented Living Labs. Finally, we provide a preliminary list of criteria for linking existing Living Labs to ULTIMATE Case Studies and end with our conclusion.

1.2. Methodology

We will identify existing Living Labs (LL) in the regions of the ULTIMATE cases by using the existing Water Europe LL inventory and provide the criteria derived from our WSIS-LL typology to work with them towards upgrading their status to WSIS-LLS.





2. The Living Lab Approach

Living Labs according to ENoLL (2016) are “user-centered, open innovation ecosystems based on a systematic user co-creation approach that integrate public and private research and innovation activities in communities, placing citizens at the centre of innovation.”

WOLLs on the other hand, as defined by Water Europe, are real-life, water oriented and demo-type and platform-type environments with a cross-sector nexus approach, which have the involvement and commitment of multi-stakeholders, provide a real life “Field Lab” to develop, test, and validate a combination of innovative solutions. This includes digitalization and their integration in combination with new business and governance models, and innovative policies based on the true “Value of Water”.

The Living Labs have emerged as an approach for participative and innovative research and development across geographical regions at the convergence of different interest areas, including sustainability, social learning, capacity building, scalability, and open innovation issues. In general, Living Labs create opportunities, in the private sector for new forms of business development and collaborative tools while the public sector gains from its participative approach.

However, best practices from research and industry need to be examined to understand how the Living Labs can be created and persist over time, as a viable approach. There is a need to define a criterion on the process of creating and maintaining Living Labs, which would ensure a sustainable network of open innovation.

The ULTIMATE project has 9 Case Studies (Table 1) who all form partnerships in order to ensure involvement and engagement of multiple stakeholders and a sustainable network of open innovation. It is desired to connect and evolve the ULTIMATE Case Studies into long-term Living Labs, as per Deliverable 3.1. As such, an evaluation framework with a set of pre-defined Living Lab-Case Study linking criteria has been devised in order to achieve D3.1. This set of linking criteria will then be analysed in Deliverable 3.2 “WSIS-Living Labs: Gap analysis and recommendations” in order to best adapt them to the needs of the ULTIMATE Case Studies





Table 1. ULTIMATE Case Studies (CS) Overview

CS #	Theme / Industry	Location	Partners
1	Petrochemical	AITASA - Tarragona Industrial Water Company	EUT
2	Ecosystem, Horticulture	Nieuw Prinsenland	KWR
3	Chemical	ARETUSA Rosignano	WEST, Solvay (Aretusa PPP), UNIVPM
4	Rural development, Food	Alberta	NTUA, GTG
5	Beverage	FC Aqualia	SMVAK
6	Sustainable development, Food	Mekorot Israel National Water Co.	GSR, GTG, AGB
7	Renewable energy, Beverage	Glenmorangie Distillery	AquaBio, UCRAN
8	Chemical	Rousillon Chemical Platform	SUEZ-RR
9	Ecosystem, Bio-Technology	Kalundborg	Novo, Xflow

In order to provide linking criteria to transition the 9 ULTIMATE Case Studies into long-term Living Labs, ULTIMATE adopts parts of the evaluation criterion from the CentraLab, originally developed by Alcotra Innovation Project (CentraLab) to cover not just the rural segment but also to best serve transnational or area-based local development strategies. In addition, we analyse, compare, and extract essential elements in Van Geenhuizen's (2018) framework for the evaluation of Living Labs and the evaluation criterion from the WOLLs Atlas.

We believe that a combined evaluation framework is needed for Water-oriented Case Studies that often requires a tailored approach to suit area-based needs and its wide range of geographical scope (i.e. urban, industrial and rural). Altogether these interrelated frameworks ensure the application of the key principles of the Living Lab approach recommended by ENoLL (i.e. value, influence, sustainability, openness and realism) and by Water Europe in its implication with the water-domain.





2.1. Linking Criteria to the ULTIMATE Case Studies

To best guide our Case Studies on the implementation of activities following the Living Lab approach, the linking criteria below are suggested.

Criterion 1. Community building and proper functioning

This linking criterion is an important indicator of the type of community building and engagement strategy that the Case Studies can adopt as a foundation to their Living Lab approach including a balance of stakeholder and citizen participation in a quadruple helix actors or People Public Private Partnerships (PPPP). The Water Europe's Living Labs Atlas also emphasized the need for Living Labs to have a water mission and strategic interest in Water Europe Clusters.

Criterion 2: User driven, Open Innovation methodology implementation

This linking criterion examines the type and range of tools and methods adopted to ensure deep engagement of users / stakeholders in the co-creation processes. In the user-driven approach, users are not considered passive respondents but active co-producers; tools and methodologies are important in order to facilitate that. The key to success in any Living Lab activity is to involve the users from the beginning of the process. Users participate in experiments, empower stakeholders-citizens engagement through co-creation, and enhance place-based user experience. This requires integration of real-life structures and ICT infrastructures where experimentations and tacit knowledge are shared and innovations created, re-created and validated

Criterion 3. Planning and collaboration outcomes

This criterion is related to the end result of collaborations such as the success of new and/or innovative products, processes and services experimented or launched through the planning and collaboration.

Criterion 4. Capacity Building / Transferability potential

One of the main challenges in Water-oriented Living Labs according to Water Europe is the issue of scaling up, particularly the lack of enabling structure and environment that motivates stakeholders from various sectors and industries to commit and engage in the WOLLs. By addressing these issues we hope to create a greater impact on WOLLs innovation system and growth beyond the immediate participants. This involves the WOLLs approach taking a role as a “real life demonstrator”, allowing stakeholders to take part in the full life cycle of research and development including testing and deployment of innovative solutions. The WOLLs approach can successfully bridge the gap existing between research and innovation results and their outreach to the real market by addressing not only effective governance but also its system's capacity in orienting and motivating public and the public investment to





address challenges in a concrete way.

In view of scaling up of results, this criterion looks at capacity building and strong transferability potential that are essential to the continuity of the WOLLs. Transferability criterion includes not only knowledge transfer but also sharing results and knowledge generated in their activities (Bergvall-Kåreborn et al., 2009).

Criterion 5. Iterative Design of Processes and Organizational Strategies

The “service offerings” criteria of WOLLs should include provisions to develop concrete work plan and organizational strategy by applying human-centered design principle, processes and methodologies for continuous stakeholder retention, value creation, research, evaluation, and development.

Human centered design (e.g. Ferri and Waal, 2017) includes the iterative process of knowledge exploration, citizen-stakeholder engagement, value creation and exploitation of resources that captures, discovers, and creates new knowledge through willingness to experiment, trying new variations and new forms of play, risk taking, and degree of openness in collaboration, co-creation and learning.

Criterion 6. Sustainability and Social Impact

Living Labs, as defined, are living bottom-up structures, and as such they have to be created to suit the local and geographical scale in which they operate to ensure long-term sustainability of the activities. This is especially true for WOLLs, which require a level of maturity and structure that must be continuously evaluated, analysed and tailored according to the organisation's changing environment and roles. The key to sustainability and continuity according to Water Europe is to motivate the users/stakeholders; which can be achieved through the principle of user empowerment. Such “influence” sets the empowerment principle apart from similar concepts, “such as participation, involvement, and engagement” (Ståhlbröst and Holst, 2012).

2.2. Suitable Linking Sub-criteria

Based on extensive literature, the evaluation criterion developed within Alcotra Innovation and CentraLab and Water-Oriented Living Labs Atlas, including our discussions with Water Europe in view of their WOLLs challenges, we elaborate on the Linking Criteria listed in the previous section by providing suitable sub-criteria (Table 2).





Table 2. Main Linking Criteria and corresponding sub-criteria

<p>1. Community building and proper functioning</p> <p>1.1. Scope of participation of stakeholders - citizen involved in the LL</p> <p>1.2. Community and communication infrastructure used by the LL</p> <p>1.3. Stakeholders motivation and commitment</p> <p>1.4. Mission/value creation with consideration for cultural and ethical values</p> <p>1.5. Quadruple Helix/multiple stakeholders participation represented in the LL</p> <p>1.6. Strategic Interest in Water Europe Clusters (i.e. Grey-Green Infrastructure, Digital Water, Value in Water, Value of Water)</p> <p>1.7. Satisfaction of the participants in the overall composition and functioning of the LL</p>	<p>2. User driven, open innovation methodology implementation</p> <p>2.1. Co-creation, rapid prototyping or validation tools used to scale up innovation and businesses</p> <p>2.2. Range of co-creation and open innovation process and methods used</p> <p>2.3. Online Participation/web strategy (such as online discussions, campaigns, file sharing, online democracy, etc.)</p> <p>2.4. Offline Participation (e.g. face to face activities such as meetings, events, workshops)</p> <p>2.5. Satisfaction of the participants in the implementation of open innovation principles in the LL</p>	<p>3. Planning and collaboration outcomes</p> <p>3.1. Success of new and/or innovative products, processes and services experimented or launched through collaboration</p> <p>3.2. Magnitude of co-planned or co-piloted projects/activities</p> <p>3.3. Level of integration and continuity of the collaborated projects</p> <p>3.4. Satisfaction of the participants in partnerships, strategic alliances, and business plans produced</p>
<p>4. Capacity building and transferability potential</p> <p>4.1. Stakeholders` role in the full life cycle of R&D including testing and deployment of innovative solutions.</p> <p>4.2. Facilitation of activities for knowledge transfer, communication and dissemination to scale up successful digital solutions</p> <p>4.3. Co-creative, participative and cross-sector approach to designing and implementing smart and sustainable local solutions</p> <p>4.4. Level of administrative capacities to support and maintain stakeholder engagement and digitalisation.</p> <p>4.5. Performance of the LL environment in terms of stakeholder retention, and the extent of knowledge sharing and transfer</p>	<p>5. Iterative design of processes and organizational strategies</p> <p>5.1. Development of a concrete work plan and organizational strategy by applying human-centered design principle, processes and methodologies for continuous stakeholder retention, value creation, research, evaluation, and development</p> <p>5.2. Integration and embeddedness within the community such as focus groups, community of practice, and supportive policies, etc.</p> <p>5.3. Integration of real-life structures and ICT infrastructures where experimentations and tacit knowledge are shared and innovations created, re-created and validated</p> <p>5.4. Exploitation of existing resources, knowledge, skills and competences.</p> <p>5.5. Satisfaction of the participants in its iterative design of processes and organizational strategies</p>	<p>6. Sustainability and social impact</p> <p>6.1. Level of user empowerment which is evident and traceable throughout the entire process (from early involvement of users and key stakeholders from the start of an activity or project until the deployment phase)</p> <p>6.2. Level of involvement/response to societal, ethical and community issues and respect to important societal values</p> <p>6.3. Organization of governance, effectiveness of management structure, ownership drivers and funding strategies</p> <p>6.4. Level of engagement of the Public Authority and the community</p> <p>6.5. Influence of the project or activity on policies and strategies</p> <p>6.6. Potential for gender-balanced/youth employment creation</p>





3. Conclusion

This report has developed a preliminary list of criteria for linking CSs to LLs to transition towards WSIS-LLs and proposes a tailored approach through continuous evaluation to integrate the user-centric process design of Living Labs towards a WSIS-LL. In the design of the criterion, we considered Living Lab`s learning and collaborative processes and their outcomes, which requires openness of the environment: real-life structure, ICT infrastructure, and willingness of the participating actors to experiment, try new forms of play, take risk, and allow openness in collaboration, co-creation and learning- along with exploitation of existing resources, skills and competences. We also considered the issues of scaling up of the Water-Oriented Living Lab`s, particularly through the need for an enabling structure and environment that motivates stakeholders from various sectors and industries to commit and engage in the Water-Oriented Living Labs. Finally, we defined the following set of linking criteria between the Living Labs and Case Studies:

- **Community building and proper functioning**
- **User driven, open innovation methodology implementation**
- **Planning and collaboration outcomes**
- **Capacity building and transferability potential**
- **Iterative design of processes and organizational strategies**
- **Sustainability and social impact**

The proposed framework of linking criteria can be used as a “check-list” in the design of on-going evaluation or for “guidance” towards a Living Lab approach. Finally, the framework puts an emphasis on the participatory nature of the evaluation process; as such the elaboration of an enquiry, analysis, and outcomes are subject to interpretation and feedback of the participating actors.

In view of data collection, we have gathered a preliminary list of evaluation characteristics and performance factors mainly derived from literature, and this list was checked and modified considering the characteristics of our Case Studies and validated with our discussions with Water Europe and from the review of the Water-oriented Living Labs Atlas Case Studies.





4. References

Bergvall-Kåreborn, B.; Eriksson, C.I.; Ståhlbröst, A.; Svensson, J. A. (2009). Milieu for Innovation—Defining Living Labs. In Proceedings of the 2nd ISPIM Innovation Symposium: Stimulating Recovery—The Role of Innovation Management, New York, NY, USA, 6–9 December 2009. Available online: <https://pdfs.semanticscholar.org/a210/711d9b9bc0a28daa8bb03cfa0f9813a01210.pdf> (accessed on 01 October 2020).

Bergvall-Kåreborn, B., Holst, M., & Ståhlbröst, A. (2009). Living Lab – An Open and Citizen-Centric Approach for Innovation. *International Journal of Innovation and Regional Development* 1(4), pp. 356 – 370.

CentraLab Consortium. CentraLab: User Driven Innovation for Regional Development. Available online: <http://centralivinglab.eu/index.php/en/documents/finish/130-promotion/734-centralab-user-driven-innovation-for-regional-development-final-publication> (accessed on 15 October 2020).

ENoLL Application Guidelines - 13th Wave. Available online: <https://issuu.com/enoll/docs/397044439-enoll-application-guidelines-13th-wave> (accessed on 15 October 2020).

Ferri, G. and Waal, M. D. (2017). A lab of labs: methods and approaches for a human-centered design. Available online: <http://www.publishinglab.nl/wp-content/uploads/2017/11/ALabofLabsWEB.pdf> (accessed on 1 October 2020).

LEADERS. Approach for Establishment and Operating of Living Labs. Available online: <https://www.user-participation.eu/planning-the-process/step-5-participatory-methods/development-of-services-or-products/leaders> (accessed on 1 October 2020).

Leminen, S., & Westerlund, M. (2017). Categorization of Innovation Tools in Living Labs. *Technology Innovation Management Review*, 7(1): 15–25.

Ståhlbröst, A. & Holst, M. 2012. *The Living Lab Methodology Handbook*. Luleå, Sweden: Plan Sju Kommunikation AB.

Van Geenhuizen, M. (2018). A framework for evaluation of living labs as boundary spanners in innovation, *Environment & Planning, C*, 36, 1280–1298.

Water Europe. (2019). *Atlas of the EU Water Oriented Living Labs*. ISBN 9789082770650. Available online: <https://watereurope.eu/wp-content/uploads/2019/07/Atlas-of-the-EU-Water-Oriented-Living-Labs.pdf> (accessed on 1 October 2020).





Annex 1: ENOLL's Evaluation Criteria

A Living Lab is an activity that has a defined approach to support its actions. Typically, this approach is based on five key principles, which guide the operations of a Living Lab (Ståhlbröst, 2012). Based on these five key principles, ENOLL set their evaluation criteria as follows:

1. Operations

- 1.1. Evidence of co-created values from research, development and innovation.
- 1.2. Business–citizens–government partnership: strength and maturity.
- 1.3. Organization of Living Lab governance, management and operations.
- 1.4. Interest and capacity to be active in EU innovation systems.

2. Openness

- 2.1. Level of own commitment to open innovation processes.
- 2.2. Intellectual property rights (IPR) principles supporting capability and openness.
- 2.3. Openness towards new partners and investors.
- 2.4. Channels (e.g. web) supporting public visibility and interaction.

3. Resources

- 3.1. Availability of required technology and/or test-beds.
- 3.2. Business model for Living Lab sustainability.
- 3.3. International networking experience.
- 3.4. People /positions dedicate to Living Lab management and operations

4. Users and Reality

- 4.1. Measures to involve users.
- 4.2. Reality usage contexts, where the Living Lab runs its operations.
- 4.3. User-centricity within the entire service process.
- 4.4. Quality of user-driven innovation methods and tools.

5. Value

- 5.1. Evidence of co-created values from the Research, Development and Innovation
- 5.2. Values/services offered/provided to Living Lab actors.
- 5.3. Full product life-cycle support – capability and maturity.
- 5.4. Living Lab covers several entities within value chain(s).

(Source: ENOLL 13th wave, adapted from application brochure).

