

# EVALUATING LIVING LABS – ANNOTATED BIBLIOGRAPHY

## (C1. CAPACITY FOR REAL-TIME MEL)

### About this annotated bibliography:

This annotated bibliography provides highlights from each citation with attention to themes that will assist in designing Utilization-focused Evaluation and Development Evaluation.

**Keywords:** living labs evaluation, monitoring, learning, decision-making, collaborative evaluation

**Take-away summary:** a table is included at the start; the elements or themes from the articles are clustered into common categories (either within the Harmonization Cube or as a complement) that can become a guide for primary evaluation users or co-designers of an evaluation to determine possible evaluation purposes or uses. Additional dimensions that require attention include “levels” (micro, meso, macro) while others refer to different “stages of maturity” of LLs. The systemic nature of LLs makes categorizing difficult as many have interrelated features.

**PART A:** a collection of articles that contribute LL elements that will guide evaluation design by pointing at elements or themes that can become “evaluation uses” and sub-themes that can become “key evaluation questions”.

**PART B:** a collection of articles [in alphabetic order by author] that contribute broadly to LL evaluation thinking by advocating for evaluation approaches or providing complementary ideas of interest to evaluation design.

This annotated bibliography will be updated as time allows, and updated versions will be prepared and shared through DeSIRA-LIFT’s Community of Practice website.

**Acknowledgment:** we are grateful to the European Network of Living Labs (ENoLL) for sharing their collection of living lab literature.

*1) The harmonization cube includes five themes: user involvement; service creation; governance; infrastructure; innovation outcomes; methods and tools (see for example: Sasic Kalagasidis, A., Hagy, S., Marx, Ch. (2017). The HSB Living Lab harmonization cube. Informes de la Construcción, 69(548): e224, doi: <https://doi.org/10.3989/id.55038>)*

## Take- away summary

### Clustering the broad categories into evaluation purposes / uses (in UFE).

	Author	USE 1 vision / accountability	USE 2 operationalization	USE 3 learning, methodology, stakeholders	USE 4 scaling	USE 5 outcomes	USE 6 context / sustainability
1	Ballon et al. 2018	Realism		Openness		Value Influence	Sustainability
2	Beaudoin et al. 2022 (*)					Impacts (social, socio- environmenta l) and process	Enabling conditions for success
3	Bronson et al. 2021						
4	Kovács, K. 2016	The organizational "issue" column covers some accountability evaluation uses	The service creation "aspect" covers related operational evaluation uses	The methods & tools "issue" column covers related methodology evaluation uses	The scalability "phase" covers related scaling evaluation uses	The innovation "aspect" covers related outcome evaluation uses	The infrastructure "aspect" covers related [building] contextual evaluation uses
5	Osorio et al. 2019		Culture and community Team work	Ecosystem approach		User-centric innovation	Real world context Life span
6	Salminen et al. 2011		Focus on levels of maturity	Overview of methods used	Reliability, usability, adaptability, adoptability	Reliability, usability, adaptability, adoptability	Technological vs social innovation
7	Santonen et al. 2020	Purpose	Membership Communication Resources	Structure-process			Environment
8	Sasic Kalagasidis et al. 2017 (**)	The organizational "issue" column covers some accountability evaluation uses	The service creation "aspect" covers related operational evaluation uses	The methods & tools "issue" column covers related methodology evaluation uses	The scalability "phase" covers related scaling evaluation uses	The innovation "aspect" covers related outcome evaluation uses	The infrastructure "aspect" covers related [building] contextual evaluation uses
9	van Geenhuizen et al. 2018	Accountability (work plans, budget)		Evolving learning process, co- creation	Broader networking	Evolving learning process, values	Real-live environment
10	van Waes et al 2021		Visions and expectations	Networks, actors, resources		Learning	

	Author	USE 1 vision / accountability	USE 2 operationalization	USE 3 learning, methodology, stakeholders	USE 4 scaling	USE 5 outcomes	USE 6 context / sustainability
11	Vervoort et al 2002	Strategy (governance, business model, culture)	Operations (human resources, inputs)	Openness (innovation process, ownership)	Users & reality (quality of process, engagement , methods, tools)	Impact & value co- creation (values, outcomes)	Stability & harmonization (sustainability, scaleup)
12	Westerlune et al. 2018	Objective	Funding Communication	Openness Stakeholders Values Methods	Governance		Funding Infrastructure

(\*) Many of the themes refer to the overall evaluation approach, as opposed to actual evaluation uses / purposes.

(\*\*) The living lab harmonization cube provides 6 x 3 x 3 combinations, the ones in this table are illustrations of options that align with the use categories.

## ITEM A.1

Ballon, P., Van Hoed, M., Schuurman, D., 2018. The effectiveness of involving users in digital innovation: Measuring the impact of living labs. *Telematics and Informatics* 35(5): 1201-1214. doi: <https://doi.org/10.1016/j.tele.2018.02.003>

This paper mentions several challenges in evaluation of LLs: limited causality; scope; spill-over outcomes; and appropriate methods. The authors review the logical model (inputs, activities, objectives/outputs (short-term, mid-term, long-term). They also refer to the need to pay attention to the micro (user involvement), meso (innovation projects) and macro (innovation environment) levels.

The following five principles are proposed to guide assessment (from Ståhlbröst, 2012:

- (1) Value: whether living labs are able to create value not just for all partners involved in the project but also for eventual customers and users;
- (2) Sustainability: the question of whether living labs take responsibility for the environmental, social and economic effects they create;
- (3) Influence: the degree to which influence of users on the innovation and development processes shaping society, is stimulated and enacted;
- (4) Realism: the degree to which results are generated that are valid for real markets by orchestrating realistic use situations and understanding users' behaviour, and
- (5) Openness: whether the adequate level of openness is employed in terms of ideas, activities and results to be able to cooperate and share in a multi-stakeholder milieu. (Section 3.2)

The authors conclude that: "...while most scholars and practitioners appear to agree on this [the need to evaluate impact], no systematic impact studies of living labs exist up until this day. One reason for this is to be found in the historical roots of living labs, i.e. the rather idealistic tradition of social experiments and cooperative design on the one hand, and a range of 'techno-optimistic' or 'technology-push' initiatives on the other. Neither tradition has typically been concerned with systematically measuring impacts." (section 2)

### Take-aways for UFE

The three levels (micro, meso, macro) are consistent with other papers (see Vervoort et al 2002;)

The five principles have been borrowed by Vervoort et al 2002, as proposed by Ståhlbröst, A. 2012)

Evaluation USE	Key Evaluation Question	Evidence needed
To document and verify the added <b>value</b>	What has been the added value for different types of stakeholders (co-producers, users, regulators, civil society, etc.)	Qualitative and quantitative data on perceived value by stakeholders (cost/benefit, convenience, reliability, un-expected outcomes, etc.)
To document and verify the level of openness achieved	<ul style="list-style-type: none"> <li>To what extent are / were LL activities open to relevant stakeholders?</li> <li>To what extent are the outcomes / solutions accessible/ affordable to/by the target audiences?</li> </ul>	Process documentation and SWOT on methodologies / events Perceptions by users (focus groups) on attributes of the outcomes / solutions

### ITEM A.2

Beaudoin, C.; Joncoux, S.; Jasmine, J-F.; Berberi, A.; McPhee, C.; Schillo, R.S. & Nguyen, V.M. (2022). A research agenda for evaluating living labs as an open innovation model for environmental and agricultural sustainability. Environmental Challenges 7: 100505. <https://doi.org/10.1016/j.envc.2022.100505>

This paper gathers multiple perspectives towards an integrated research agenda on the evaluation and effectiveness of living labs, with attention to environmental and agricultural sustainability. The findings are organized into a table with themes, sub-themes, and synthesis questions.

Theme	Subtheme	Sample questions
1.The role and diversity of relevant actors in the evaluation	<ul style="list-style-type: none"> <li>• Role of the different actors</li> <li>• Differentiated actor involvement</li> <li>• Role of the evaluators</li> <li>• Diversity of actors</li> <li>• Equity and power relations</li> </ul>	<p>What conditions enable each category of actors to fully participate in evaluation of living labs?</p> <ul style="list-style-type: none"> <li>• What forms of evaluation are most conducive to including actors in the process?</li> <li>• Which moments of evaluation are most conducive to including actors in the process?</li> <li>• How can evaluations take into account differing needs and priorities of actors who work within different timelines and timescales?</li> <li>• What issues are tied to the different positions of evaluators?</li> <li>• What types of diversity should be considered in the evaluation of living labs?</li> <li>• How can the contributions of non-human actors be evaluated in living labs?</li> <li>• How can representation and power be balanced between the different actors in the evaluation process?</li> <li>• How does the process of evaluation influence the balance of relationships among actors?</li> <li>• How can the process be taken into account?</li> </ul>
2.The objects of evaluation	<ul style="list-style-type: none"> <li>• Impacts in general</li> <li>• Process</li> <li>• Social impacts</li> <li>• Social-environmental impacts</li> </ul>	<ul style="list-style-type: none"> <li>• What methods are appropriate to evaluate the impact of living labs?</li> <li>• How could mixed methods design provide tools for the evaluation of living lab outcomes?</li> <li>• How do specific mechanisms of living labs relate to the various types of innovation adoption?</li> <li>• What are the connections and mutual influences between key dimensions of living labs?</li> <li>• How can these connections be established and influenced?</li> <li>• Can cost-benefit analysis be used to outline project goals for living labs?</li> <li>• How can concerns for efficiency in co-creation be balanced in living labs and their evaluation?</li> <li>• What are the trade-offs?</li> <li>• How can participation in the evaluation of living labs be encouraged?</li> <li>• How can tensions related to the lack of willingness to participate be overcome?</li> <li>• How does the value of social impact differ according to the specific characteristics of the actors in a living lab?</li> <li>• What key dimensions of evaluation can capture the social impacts of living labs?</li> <li>• What are the indicators of social impacts for a variety of actors at different scales of living labs?</li> <li>• What are the best methods to evaluate specific social processes and outcomes of living labs?</li> <li>• What key criteria of best management practices can be measured and compared?</li> <li>• How can we operationalize these criteria?</li> <li>• What indirect impacts and outcomes do living labs have on individuals, groups and society?</li> <li>• How is sustainability defined in the evaluation of living labs?</li> <li>• How can social and environmental impacts of living labs be assessed simultaneously?</li> <li>• What are the qualitative approaches used to measure social, environmental, and socio-environmental impacts?</li> <li>• How do living labs and their evaluation relate to solving complex problems (wicked problems)?</li> </ul>

Theme	Subtheme	Sample questions
3.The objectives of evaluation and the use of results	<ul style="list-style-type: none"> <li>Purpose of evaluation</li> <li>Use of evaluation results</li> <li>Funding</li> </ul>	<ul style="list-style-type: none"> <li>How can the different objectives and interests of actors be considered and integrated in the evaluation of living labs?</li> <li>What are different uses of living labs evaluations in diverse contexts?</li> <li>How can evaluation itself influence the process and results of the living lab?</li> <li>How do various funding contexts impact the evaluation process of the living labs?</li> </ul>
4.Methods and tools for evaluations	<ul style="list-style-type: none"> <li>Methods</li> <li>References</li> <li>Perspective</li> <li>Trust</li> <li>Comparison</li> </ul>	<ul style="list-style-type: none"> <li>How can a common methodology be established for the evaluation of living labs?</li> <li>What are the strengths and limitations of different methods to evaluate living labs?</li> <li>How might existing frameworks from other fields be used to evaluate the "building blocks" of living labs across sectors and contexts?</li> <li>How can a collection of references and tools support the evaluation of living labs?</li> <li>How can evaluation support improved understanding of the different points of reference of actors in living labs?</li> <li>What are the roles of subjectivity and objectivity in the different evaluation processes of living labs?</li> <li>What role do trust and willingness to share data play in the evaluation of living labs?</li> <li>How does the evaluation of living labs compare with evaluation of other approaches?</li> <li>What methods, metrics, and criteria of evaluation for living labs are needed to compare between projects, sectors, contexts, specific processes, and overall approaches?</li> </ul>
5.The scales of evaluation and impacts	<ul style="list-style-type: none"> <li>Scales</li> <li>Integration</li> </ul>	<ul style="list-style-type: none"> <li>Which evaluation methods and tools should be used at what scales?</li> <li>How can evaluation methods be integrated across various scales to obtain a holistic understanding of living labs?</li> </ul>
6.The temporality of evaluations and impacts	<ul style="list-style-type: none"> <li>Temporality</li> <li>Measurement</li> <li>Alignment</li> <li>Evolution</li> </ul>	<ul style="list-style-type: none"> <li>What are the evaluation methods and tools specific to the different stages of evaluation?</li> <li>How can the different dimensions of living labs be measured at each stage?</li> <li>How can different timelines of actors be aligned in living labs?</li> <li>What are the impacts of mismatches?</li> <li>How do behaviours, perspectives, and knowledge of living lab actors change over time?</li> </ul>
7.Enabling conditions for success	<ul style="list-style-type: none"> <li>Definition and measure of success</li> <li>Conditions for success</li> <li>Roles of mistakes and failures</li> </ul>	<ul style="list-style-type: none"> <li>How is success defined in different living labs?</li> <li>How can the diversity of definitions of success among actors be considered in the evaluation of living labs?</li> <li>How do these definitions influence evaluation?</li> <li>What are enabling conditions for successful living labs?</li> <li>What participant characteristics enable successful living labs?</li> <li>What are the roles of mistakes and failure in success of living labs?</li> </ul>

**Observations:**

Many of sample questions listed under themes 1 and 2 are not actual evaluation questions, but rather relevant questions about what evaluation approach should be utilized. Under theme 3, there is a question that invites Developmental Evaluation (How can evaluation itself influence the process and results of the living lab?).

There are multiple questions that refer to dimensions of a living lab strategy, and could become evaluation questions once those specifics were spelled out. Example under 7: “How is success defined in different living labs?” The evaluation of this theme would need to refer to a proposed set out outcomes and assumptions (for example in a Theory of Change) to be verified.

The authors add: “The approach moves away from using exclusively technocratic and top-down approaches to include bottom-up activities and community-based approaches, thus aligning with the increased recognition and use of participation and collaboration in environmental research and governance).” This is very compatible with utilization-focused evaluation that invites direct participation of various stakeholders in evaluation design and implementation.

**Take-aways for UFE**

The different “themes” summarize a wish list for LL evaluation, and some of the associated sub-themes and questions point towards strategic dimensions of LL that need attention.

The wish list often flags “readiness” issues that are part and parcel of planning a UFE (Example on evaluator readiness: “What issues are tied to the different positions of evaluators?”

The reference list in the article does not include literature in collaborative approaches to evaluation. There seems to be great potential to connect with this established literature.

**ITEM A.3**

Bronson, K.; Devkota, R. & Nguyen, V. (2021). Moving towards generalizability? A scoping review on measuring the impact of living labs. Sustainability 13(502): <https://doi.org/10.3390/su13020502>

This paper focuses on the challenge of measuring and evaluate both the performance of a given LL process and its wider impacts. The authors reviewed 138 articles. The dominant method for evaluation is comparative qualitative case studies. The authors conclude that there is a tension between the specificity of LL studies Vs a universal framework to guide the impact assessment of LLs across different locations to provide generalizability.

- A summary of “approaches” is provided (Figure 8), which are actually data collection tools. There is emphasis on action research methods, qualitative and participatory evaluation tools.
- The authors identified 41 articles that were relevant, out of which only two referred to agro-ecology and sustainability; and those articles did not reveal any ‘generic innovation ecosystem model’ that could accommodate a LL infrastructure.
- The authors provided a summary of evaluation frameworks or models used in LL evaluation literature:

- Digital co-creation Index (DCCI)
- The four-capital method of sustainable development evaluation (Elkins et al 2008)
- Conceptual framework: mixing user-centred strategy and participatory strategy
- Logical effect model for LL projects
- A maturity grid-based assessment tool
- Harmonization cube (Kovaks)
- Business Model Canvas (BMC)
- Living Lab triangle conceptual model
- Process Reference Model (PRM) for Living Lab
- Key 5 principles to guide the evaluation process in LL (Ståhlbröst)
- Monitoring framework for C@R rural living labs (Guzman et al)
- Living Lab Analysis Model (LLAM), (Chen & Chou)
- SNA (Social Network Analysis). MASAI (Marketing Strategies and Business Intelligence Model) and PACE (Project Assets, Core competencies and Exploitable items)
- The Sustainable Livelihood model

The authors conclude that common elements include: the assessment of engagement and diversity of stakeholders; a longitudinal review of the evolution of LL over time, and financial sustainability. Some principles mentioned for evaluation design include: value, sustainability, influence, realism and openness. Five types of questions are also mentioned: “1. Is the product/service development and design process sufficiently on schedule (work plan and budget)? 2. Are learning results from user feedback sufficiently integrated into the design process? 3. Do the designing actors remain sufficiently aligned with each other, with a common vision and common interests? 4. What is the satisfaction of the participant actors with the results and processes so far? and 5. Is the living lab sufficiently open to attract partners in a broader network enabling support in upscaling an implementation?” (p.11)

### Take-aways for UFE

- The frameworks and models listed provide conceptual reference points as well as relevant themes that can be translated into evaluation uses or purposes
- The five types of questions are relevant for a monitoring, evaluation and learning (MEL) plan under a UFE decision-making framework (see table below)
- There is scope to enrich this literature with examples from agro-ecology LL experiences

Evaluation USE	Key Evaluation Question	Evidence needed
To monitor and improve the implementation process	Is the product/service development and design process sufficiently on schedule (work plan and budget)?	Deliverables reporting for OPSYS likely covers much of this theme
To adjust project design based on stakeholder inputs	Are learning results from user feedback sufficiently integrated into the design process? [additional questions to add on the monitoring methodology]	Qualitative and quantitative feedback from important events and activities
To build on common interests and acknowledge differences	Do the designing actors remain sufficiently aligned with each other, with a common vision and common interests?	As above [Question needs rewording to avoid a yes/no answer]
[could be combined with #2]	What is the satisfaction of the participant actors with the results and processes so far?	
To scale up the process	Is the living lab sufficiently open to attract partners in a broader network enabling support in upscaling an implementation?	Interviews with other stakeholders and networks [Question needs rewording to avoid a yes/no answer]



## ITEM A.4

Kovács, K. 2016. Evaluation and practice of interactive value production in living labs. Periodica Polytechnica Social and Management Sciences 24(1): 52-50.  
<https://doi.org/10.3311/PPso.8336>

Cube [also covered by Sasic Kalagasidis et al. 2017 below] the covers three stages of maturity and three issues, leading to 9 combinations.

The authors then expanded the 9 combinations across 6 Aspects: Use involvement, service creation, infrastructure, governance, innovation outcomes, and methods & tools.

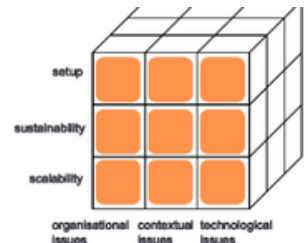


Fig. 1 The Structure of the Harmonization Cube (Murder et al, 2008)

Each aspect corresponds to one side of the cube.

This framework was applied with ENoLL members and reflected on the potential and challenges of implementing an evaluation with these multiple domains. Among other tools they opted for scoring for the variables in each side of the cube.

The research results compare an Austrian and a Hungarian example, along the following themes:

- Tendency on interactive value production
- The relationship of the producer and users
- The source of knowledge in the developments
- Attitude – interactive value production
- Interactions to involve the users into the development process
- Identification of learn users, their role
- The relevancy of interactive value production in the innovation process of the company

With regards to data collection methods, the author concludes that: “Instead of questionnaires, the preparation of deep interviews might provide reliable information for this analysis.” (p.58)

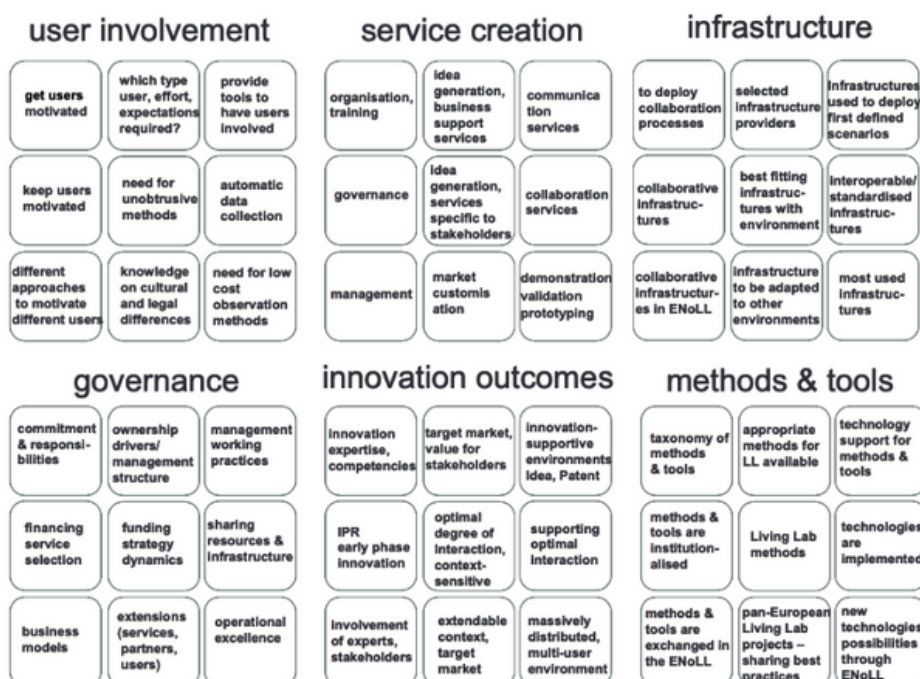


Fig. 2 The Elements of the Harmonization Cube I. (Murder et al, 2008)

Fig. 3 The Elements of the Harmonization Cube II. (Murder et al, 2008)

Fig. 4 The Elements of the Harmonization Cube III. (Murder et al, 2008)

## Take-aways for UFE

- The six aspects, three phases, and three issues provide pointers for possible evaluation uses/purposes
- The cube analogy signals the multiple, interrelated dimensions
- If comparisons are sought among different LL, the more dimensions of the cube that are addressed, the more depth there will be to the cross-case study analysis
- The research results reported as themes can provide inspiration for key evaluation questions associated [mainly] with user involvement

Evaluation USE	Key Evaluation Question	Evidence needed
To track and improve user involvement during the set-up phase	Set up/Organizational: to what extent did the different interactions involved users in the development process?	Comparing stakeholder analysis and targets in the planning stage with actual participation
To review and adjust methodologies based on users' experiences	Sustainability/Contextual: to what extent and how were the methods perceived as being interactive?	Exist survey evidence after events on outcomes and on procedures: what worked, what to add, what to eliminate

## ITEM A.5

Osorio, F.; Dupont, L.; Camargo, M.; Palominos, P.; Peña, J.I. & Alfaro, M. 2019. Design and management of innovation laboratories: Towards a performance assessment tool. *Creativity and Innovation Management* 28(1): 82-100  
<https://doi.org/10.1111/caim.12301>

This paper offers a maturity grid and contains elements to guide a UFE design. The maturity grid includes criteria for each of four maturity levels:

TABLE 2 Maturity grid for the Strategic Intention pillar

Criteria	Description	Level 1	Level 2	Level 3	Level 4	Reference
Strategic Goals	To support organization/partnership mission	No goals defined	Short-term goals. Not measurable.	Medium-term goals. Clear thematic goals. Measurable.	Long-term and sustainability goals. Measurable.	Moultrie, Nilsson et al., 2007
Ecosystem Approach	To generate added value for all the stakeholders involved, creating long-term engagement and identification with the laboratory.	No value creation. No sharing for stakeholders.	Partially Sharing. Missing links between stakeholders. No equal contribution.	Value and sharing for most of the stakeholders.	Value creation and sharing for all stakeholders. Long engagement.	Dupont et al., 2014; Veeckman, Schuurman, Leminen, & Westerlund, 2013
Real-World Context	To capture or resemble real-life environments (through space, equipment or methodologies).	Test-bed-like.	Natural setting with limitations.	Real world with time and space limitations.	Real-world context. No limitations.	Schuurman et al., 2013; Veeckman, Schuurman, Leminen, & Westerlund, 2013
User-centric Innovation	To involve users in the different phases of the innovation cycle in which they can test, evaluate, contribute and co-create.	No interaction with users. No evaluation. No co-creation.	Users seen as passive actors (testers). Limited evaluation. No decision-making by users.	User as contributor. Interactive evaluation. Feedback may lead to modifications.	Users as co-creators. Multiple channels and iterative feedback from users.	Schuurman et al., 2013; Veeckman, Schuurman, Leminen, & Westerlund, 2013
Culture and Community	To build an identity and to grow a community of engaged and motivated users with access to the laboratory.	No community. No cultural identity.	Few people know and access the space. Limited access to space. Contrasting internal & external images.	Established community. Frequent access and events. Officially known cultural identity.	Engaged and active community. Cultural identity and coherent internal/external. High frequency of interaction.	Moultrie, Nilsson et al., 2007; Dupont et al., 2017 and author's experience
Teamwork	To enhance teamwork in innovation, encourage better communication (physical or virtual), encourage formal and informal social interaction and motivate staff.	No intent to enhance teamwork.	Strictly formal interaction between members. Hierarchy.	Physical or virtual communications mechanisms. Staff involved and motivated with strategy.	Enhance teamwork. Boost communication. Allow social interaction (formal or informal).	Moultrie et al., 2007 and authors' experience
Lifespan	To estimate the length of the project as a whole (short-, medium- or long-term).	Short-term <1 year	Medium-term 1-2 years	Long-term 2-3 years	Very long +3 years (permanent)	Authors' experience

This paper was produced by authors in three countries (France, Colombia, Chile) and included literature in three languages.

The authors conclude that: "The main contributions of this work are: (1) an updated frame- work adapted to address innovation laboratories' strategies and capabilities involving stakeholders and communities; (2) a strategy-oriented maturity grid; (3) a multilingual gathering instrument; (4) together, the grid and the instrument envision a prototype of a maturity grid-based design and assessment tool." (pp 13-14)

### Take-aways for UFE

- The grid can help LL projects locate themselves along the maturity horizon, and select from the column with criteria/ strategic goals as elements to include in an evaluation plan, especially the description column.
- Evaluation uses can be derived from the strategic goals.

Evaluation USE	Key Evaluation Question	Evidence needed
To understand and improve user engagement over the different stages of the LL	To what extent were users involved in the different stages of the innovation cycle	If the evaluation reflects on the different maturing stages, specific questions will be asked based on the expected changes in user roles
To monitor and report on how the LL mirrored the real-world context it sought to influence	To what extent and how did the project reflect real world contexts through its venue/ space, equipment or methodologies?	As above; case study and narratives to provide evidence of real-world resemblance

### ITEM A.6

Salminen, J; Konsti-Laakso, S.; Pallot, M.; Trousse, B. & Senach, B. 2011. Assessing/evaluating living lab maturity level model through the use of a Domain Landscape. Paper presented at the 17th International Conference on Concurrent Enterprising. Aachen, Germany 20-22 June.

The authors develop an assessment method of living lab maturity, that is based on previous work exploring the domains of living lab research. The domain landscape was based on four dimensions: interaction mode, research type, evaluation focus, and collaboration style.

“Research type illustrates the way interaction with users is perceived. This dimension scales from Human-Computer Interaction (HCI), which addresses individual users, to Interpersonal Interaction which embeds social interaction within a group of people, especially large ones like online communities.

Interaction Mode splits the domain landscape into Observation Research where a user is considered as a subject and Participative Research where users actively contribute in co-creating value...

Evaluation focus starts with reliability, as a first stage, where a functional test is applied in order to check if a feature works properly but without necessarily considering whether this feature could really be useful to the users. The second stage consists to carry on usability analysis for the obvious motivation of evaluating the user-friendliness (degree of intuitively) and ergonomic design. While the third stage “adaptability” brings the evaluation of personalisation capacities (degree of look and feel recomposing), the fourth one “adoptability” allows users to create new features (composing their own services).

Collaboration style scales from structure collaboration with for example Symbiotic collaboration style (physical collocation) up to unstructured collaboration with for example Mass collaboration style (virtual or online collocation).” (p.2)

On the basis of the above domains, the authors developed a questionnaire for self-assessment of living labs (see Table 3.1)

On the basis of the feedback, they were able to locate LLs in a multi-dimensional map.

Theme	Questions	Evaluation
Interaction modes	How do users participate in Living Lab? Example?	Users as observed subjects vs. users as value creation
Research types	Do users participate in groups or as individuals? Example?	Individual users vs. group of users
Context	What is the goal of Living Lab activities? Products, services, new procedures, processes? Example?	Technological innovation vs. social innovation
Evaluation focus	What is the focus of evaluation? Technical reliability or ease of use? Example?	Reliability, usability, adaptability or adoptability
Collaboration style	How do you agree to collaborate with users? Example?	Structured vs. unstructured
Methods	What methods are used in the Living Lab? Example?	Overview of used methods

Table 3.1 - Questionnaire used in assessment of Living Labs.

### Take-aways for UFE

- The six themes were used to classify LLs inside a multi-dimensional map; in the context of UFE they provide inspiration to formulate evaluation uses.
- The second and third columns provide suggestions for key evaluation questions, in this case with a focus on several dichotomies (e.g. technological innovation Vs. social innovation).
- The evaluation row points at four uses: reliability, usability, adaptability and adoptability.

Evaluation USE	Key Evaluation Question	Evidence needed
To reconcile stakeholder expectations on their engagement experience with a living lab	<ul style="list-style-type: none"> <li>• To what extent were users involved as observed subjects Vs. uses as value creation?</li> <li>• To what extent was the collaboration style structured or unstructured?</li> </ul>	
To understand outcomes in order to explore dissemination / scaling	<ul style="list-style-type: none"> <li>• To what extent were the LL innovations reliable, usable, and adaptable?</li> <li>• Under what circumstances were they most effective?</li> </ul>	As above; case study and narratives to provide evidence of real-world resemblance

## ITEM A.7

Santonen, T.; Kjellson, F.; Andersson, K. & Hirvikoski, T. 2020. Developing a maturity model for transnational living lab collaboration. Paper presented at The International Society for Professional Innovation Management (ISPIM) Innovation Conference – Innovating in Times of Crisis, 7-10 June 2020.

The research sought to identify the drivers and obstacles for transnational collaboration by asking the following open-ended questions from the partners:

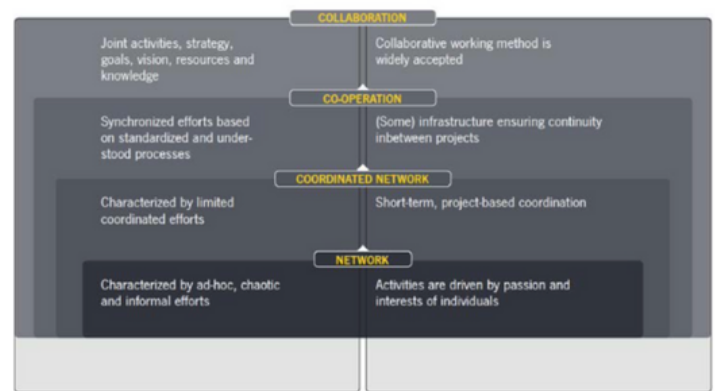
- (Q1) What are the most important parts of transnational cooperation?
- (Q2) What added value do you see for your own living lab?
- (Q3) What obstacles do you see in transnational cooperation?
- (Q4) What added value do you see for transnational cooperation?

This paper is particularly relevant to cross-country living lab projects. The authors developed a Transnational Living Lab Collaboration Maturity Model (TLLCMM) that was co-developed among living labs from seven different countries. It proposes four stages:

- Network,
- Coordinated network,
- Cooperation, and
- Collaboration.

In addition, the TLLCMM model addresses six factors:

- Environment,
- Membership,
- Structure-Process,
- Communication,
- Purpose: Goal-Vision, and
- Resources.



For each factor and sub-factor, corresponding maturity levels descriptions were defined.

### Take-aways for UFE

- The four stages of maturity can help LL project locate themselves along this gradient
- The six factors can be focused on the relevant stage of maturing when the evaluation is planned
- The factors can provide a guide to proposed evaluation uses

Evaluation USE	Key Evaluation Question	Evidence needed
To what extent was the evaluation living lab culture and environment favourable to transnational collaboration?	What were the most successful and least successful transnational collaboration events? [To be adjusted to the relevant stage of maturity]	Stakeholder feedback on process and outcomes of key events Reflection on the goal statements and outcomes of key events
To what extent and through what mechanisms did the structure – process provide adequate conflict management procedures?	<ul style="list-style-type: none"> <li>Similar to above, with focus on procedures with reference to critical junctures during implementation [To be adjusted to the relevant stage of maturity]</li> </ul>	Similar to above, with focus on procedures and examples of implementation

## ITEM A.8

Sasic Kalagasidis, A.; Hagy, S. & Marx, Ch. (2017). The HSB Living Lab harmonization cube. Informes de construcción 69(548): e224.  
<https://doi.org/10.3989/id.55038>

The case study is based on a LL in the HSB building at a university campus in Sweden. This Living Lab Harmonization Cube (LLHC) addresses the following:

- 6 Aspects: Use involvement, service creation, infrastructure, governance, innovation outcomes, and methods & tools. Each aspect corresponds to one side of the cube
- 3 development phases of a LL: set-up, sustainability, and scalability
- 3 more issues: organizational, contextual, and technological issues in a LL

**Table 1. Results of self-assessment of HSB Living Lab by LLHC.**

Organizational issues		Contextual issues		Technological issues	
Use involvement	get users involved	base of users, effort, expectations required	provide tools to have users involved	organization, have users involved	service creation, idea generation, business support services
	keep users motivated	need for unobtrusive methods	automatic data collection	governance, idea generation, services specific to stakeholders	communication, collaboration services
	different approaches for different users	knowledge on cultural and legal differences	need for low cost observation methods	market automation	demonstration, validation, prototyping
Development		Infrastructure		Management	
Commitment & responsibility	to deploy collaboration practice	selected infrastructure providers	infrastructure used to deploy first defined scenarios	Ownership drivers/ management structure	Management working practices
	collaborative infrastructure selection	best fitting infrastructures with environment	interoperable/ standardized infra-structures	Funding strategy dynamics	Sharing resources & infrastructure
	Business models	collaborative infrastructures in e.g. DSSLL*	most used infrastructures (clubs)	Extensions (services, partners, users)	Operational excellence
Innovation outcomes		Methods & tools		Technology support for methods & tools	
Innovation, expertise, competencies	Target market, value for stakeholders	Innovation-supportive environment, infra. platform	Economy of methods & tools	Appropriate methods for LL available	Technology support for methods & tools
	Optimal degree of interaction, context sensitive	Supporting optimal interaction	Methods & tools are institutionalized	LL methods	Technologies are implemented
	Extendable context, target market	Massively distributed, multi-user environment	Methods & tools are exchanged in e.g. DSSLL	Pan-European LL projects - sharing best practices	New technologies / possibilities through e.g. DSSLL

### Take-aways for UFE

- The six aspects, three phases, and three issues provide pointers for possible evaluation uses/purposes
- The cube analogy signals the multiple, interrelated dimensions
- If comparisons are sought among different LL, the more dimensions of the cube that are addressed, the more depth there will be to the cross-case study analysis

Evaluation USE	Key Evaluation Question	Evidence needed
To track and improve user involvement during the set-up phase	Set up/Organizational: to what extent did user engagement respond to the desired expected mix of stakeholders?	Comparing stakeholder analysis and targets in the planning stage with actual participation Feedback on barriers faced by stakeholders that did not participate
To review and adjust methodologies based on users' experiences	Sustainability/Contextual: to what extent and how were the methods perceived as being un-obtrusive?	Exist survey evidence after events on outcomes and on procedures: what worked, what to add, what to eliminate



## ITEM A.9

van Geenhuizen, M. (2018). A framework for the evaluation of living labs as boundary spanners in innovation. *Environment and Planning C: Politics and Space*, 36(7): on-line. <https://doi-org.subzero.lib.uoguelph.ca/10.1177/2399654417753623>

In this paper evaluation is seen as an inherent part of the living lab methodology at two levels: the micro-level of evolving learning processes (intensive co-creation among a few core actors) and the meso-level of the connected networks (co-creation from outside partners from different organizations, who sometimes act as insiders).

The paper proposed five questions that need to be addressed in the evaluation of living labs:

1. Accountability on work plans and budget: "Are the product/service development and design process sufficiently on schedule?"
2. User feedback: "Are learning results from users sufficiently integrated into the design process?"
3. Stakeholder alignment: "Do the designing actors remain sufficiently aligned with each other, with a common vision and common interests?"
4. Stakeholder satisfaction with process and outcomes: "What is the satisfaction of the participant actors with the results and processes"? and
5. Broadening engagement for upscaling: "Is the living lab sufficiently open to attract partners in a broader network enabling support in upscaling and implementation?"

The paper proposes an action-research approach that captures specific user needs, problem perceptions, amount of satisfaction and perceptions on potential solutions in developing feedback, but also trust and integration among learning partners. In addition, there is an emphasis on a model of participatory evaluation as an important input to the living lab methodology.

The following "key factors" in the performance of living labs are proposed. The first one is referred to as "a traditional one" focusing on the alignment of processes (results) with working plans and budgets. The other four questions are seen as typical for living labs: the integration of user feedback in the design process, the alignment of the different actors in goals and interests; and, the openness to attract and collaborate with partners in the implementation of the solutions.

The paper mentions that "What needs to be accepted is a certain unpredictability in learning processes and their outcomes which is inherent to experimentation and creative design and calls for some flexibility in actor roles." The author adds that: "Causality remains an important issue in the evaluation as the system approach does not prove causal relations and does not provide an assessment of their strength."

The proposed framework provides a set of preliminary key performance factors which can be used as a 'check-list' in the design of ongoing evaluation.

Factors	Overall  Develop a working plan (intended results, budgets) and plan for continuous evaluation at start, incl. participatory nature, major boundary spanning issues, etc.
	<b><i>Boundary-spanning</i></b>
2.Evolving learning processes (co-creation)	<ul style="list-style-type: none"> <li>• Early involvement of users and timely preparation in dealing with 'vulnerable' ones</li> <li>• Sufficient motivation of actors to participate</li> <li>• Adequate capabilities/skills of actors to perform roles and interact, dependent upon openness and flexibility in models/tools and exploitation/exploration</li> <li>• Multiple approaches and collaboration tools, and flexibility in actor roles, dependent upon openness and exploration/exploitation (eventually, multi-sector and multidisciplinary)</li> <li>• Ability to deal with unpredictability, dependent on openness and exploration/exploitation</li> <li>• Ability to handle conflicts and work with intermediaries</li> <li>• Sufficient gaining and absorption of end-user feed back</li> <li>• Transparent project selection and decision, eventually, design of business models</li> </ul>
3.Evolving learning processes: values	<ul style="list-style-type: none"> <li>• Legal issues, like liability, IP issues, data ownership and access</li> <li>• User-values: trust, privacy, cultural identity, wishes of self-determination, cultural 'distance' to ICT, transparency in decision-making</li> <li>• Values among managers: commitment, passion, risk-taking</li> <li>• Societal values, like sustainability and responsibility</li> </ul>
4.Broader networking	<ul style="list-style-type: none"> <li>• Involvement of all relevant actors, however:</li> <li>• Avoid large numbers of actors, powerful/dominant actors and strong interdependency; avoid actors that do not comply with living lab values</li> <li>• Give attention to upscaling, financial investment, regulators, contractors, etc.</li> <li>• Develop embeddedness with focus groups, community of practice, etc. and supportive policies (region, sector)</li> </ul>
	<b><i>Indirectly related to boundary-spanning</i></b>
5.Real-life environment	<ul style="list-style-type: none"> <li>• Shape an 'inviting' arena where improvisations and tacit knowledge are shared and inventions created and validated</li> <li>• Settle issues concerning access to places, and implementation of new infrastructure (timing, responding to willingness-to-pay)</li> </ul>

### Take-aways for UFE

- The five “questions” and the five “factors” provide broad evaluation “uses”; they will help primarily interested users of evaluation choose the reasons and purposes of the evaluation.
- The specifics in the table can inform the definition of “key evaluation questions”.
- The reference to unpredictability and weak causality is consistent with Developmental Evaluation.
- The emphasis on a participatory approach to evaluation is consistent with Utilization-focused Evaluation (UFE).



Evaluation USE	Key Evaluation Question	Evidence needed
(2) Improving learning and co-creation processes	<ul style="list-style-type: none"> <li>To what extent have the XYZ approaches and collaboration tools enabled flexibility in actor roles?</li> <li>To what extent and how has the process to dealt with unpredictability?</li> <li>To what extent and how has the process handled conflicts and worked with intermediaries?</li> </ul>	<p>Comparison of initial and current actor roles; implications for the changes</p> <p>Examples of unexpected, un-predictable outcomes and responses to them</p> <p>Typology of conflicts, conflict management responses, use of intermediaries</p>
(4) Documenting and improving scale-up and scale-out strategies	<ul style="list-style-type: none"> <li>To what extent and how has the process managed power asymmetries especially with dominant stakeholders?</li> <li>To what extent has the process led to a more enabling environment?</li> </ul>	<p>Stakeholder analysis</p> <p>Stakeholders' BATNA (best alternative to negotiated action)</p> <p>Changes in policy narratives, policy capacities, policy proposals</p>

## ITEM A.10

van Waes, A.; Nikoleva, A. & Raven, R. 2021. Challenges and dilemmas in strategic urban experimentation: An analysis of four cycling innovation living labs. Technological Forecasting and Social Change: 172. <https://doi.org/10.1016/j.techfore.2021.121004>

Process	Challenges	Dilemmas
Vision and expectations	1. Create a vision and/or concrete expectations	2. Broad vs specific experiment
	3. Ensure robust visions and expectations	4. Flexible vs persistent attitude towards vision
		Too high vs too low expectations
Networks, actors and resources	6. Building broad networks	7. Incumbents vs challengers
	8. Enabling deep networks	9. Dependency vs autonomy
	10. Navigating network tensions	
	11. Generating public acceptance and support	
	12. Organizing leadership and/or local coordination	

Process	Challenges	Dilemmas
Learning	13. Facilitate reflexive learning	14. Enabling broad learning
	15. Aligning learning goals across organizations	
	16. Learning across experiments	

The authors concluded that: "... this framework has proved useful as a sense-making and analytical device for exploring challenges and dilemmas in strategic experimentation. Future studies could use the framework for similar analysis in other domains or geographies." (6. Conclusions).

#### Take-aways for UFE

- The three process domains can guide in the choice of evaluation uses.
- The challenges and the dilemmas can guide in drafting key evaluation questions.

Evaluation USE	Key Evaluation Question	Evidence needed
To document and improve networking	<ul style="list-style-type: none"> <li>• To what extent was the process successful in managing network tensions?</li> <li>• In what ways and to what extent was local leadership activated?</li> </ul>	<p>Instances where disagreements emerged and narratives about how they were addressed</p> <p>Most significant change narratives by local leaders</p>
To allow stakeholders to do reflective learning about the LL	<ul style="list-style-type: none"> <li>• To what extent and how were different organizations able to align their learning priorities?</li> <li>• What principles may emerge to allow for cross LL experiment comparisons?</li> </ul>	<p>Comparing different organizations' learning priorities before and after the LL process</p> <p>Determination of commonalities and differences and the underlying factors that may be shared</p>

**ITEM A.11**

Vervoort, K.; Trousse, B.; Desole, M.; Bamidis, P.; Konstantinidis, E.; Santonen, T.; Petsani, D.; Servais, D.; De Boer, D.; Spagnoli, F.; Onur, O. & Bertolin, J. (2022) Harmonizing the evaluation of living labs: a standardized evaluation framework. In: Leandro Bitetti, L.; Bitran, I.; Conn, St.; Fishburn, J.; Huizingh, E.; Torkkeli, M.; and Yang, J. (Eds.) Proceedings of the XXXIII ISPIM Innovation Conference. 5 - 8 June 2022, Copenhagen, Denmark.

This paper defines a set of harmonized, weighted criteria for a comprehensive evaluation framework to be used for classifying LLs on macro–meso-micro-level approach. This effort is connected to ENoLL and its VITALIZE project that focuses on harmonization of living lab procedures. The three levels

“The Macro-level was described as the living lab’s network consisting of different stakeholders that engage in knowledge transfers, mainly around an innovative infrastructure (material and/or immaterial).

The Meso-level was referring to the innovation projects and activities carried out within a living lab

The Micro-level focused more on the living lab methodological steps and the tools used. The discussion was continued until the researcher team reached consensus.” (p.8)

The authors compared LL criteria from four existing sources and propose the following consolidated summary with six criteria:

1. Strategy (macro)

- Governance
- Business model
- Culture

2. Operations (all levels)

Operations

- Human Resources
- Equipment & infrastructure

3. Openness (all levels)

- Innovation processes & partnerships
- Ownership of results

4. Users & reality (all levels)

- Quality of the iterative LL processes in real-life settings
- User-centricity of the user & stakeholder engagement approach
- Quality of participatory tools & methods

5. Impact & value creation (all levels)

- Co-created values
- Impacts of the living lab

6. Stability & harmonisation (macro)

- Stability of the living lab (macro)
- Harmonization & scale up

The authors conclude that: “The proposed evaluation structure can help on the one hand the evaluators of living labs and the living lab networks in general to understand the potentiality of the LLs to operate at the three levels, and on the other hand to support individual living labs to regularly self-evaluate assessing their living lab performance according to the six key building blocks.” (p.16)

### Take-aways for UFE

- The three levels need attention to locate the choice of primary users, and evaluation uses.
- The six criteria are relevant in determining broad evaluation “uses”; they will help primary interested users of evaluation choose the reasons and purposes of the evaluation.
- The sub-criteria can inform the definition of “key evaluation questions”.
- The detailed definition of the criteria (pp. 12-15) will help define the type of evidence needed to respond to the KEQs.
- The six criteria also allow for comparisons of major features among different LLs within a project.

Evaluation USE	Key Evaluation Question	Evidence needed
(4) To improve the collaborative tools and methods applied in the LL	<ul style="list-style-type: none"> <li>To what extent and how were methods adapted to evolving user needs?</li> <li>To what extent were stakeholders able to contribute to the innovation process?</li> </ul>	Inventory of methods and tools Examples of adaptations Users' sense of belonging to the process Stakeholders' sense of belonging and enrichment
(5) To verify the societal impact of LL	<ul style="list-style-type: none"> <li>To what extent did stakeholder diversity &amp; inclusion change in the project area?</li> <li>To what extent did stakeholders modify their awareness about XYZ?</li> <li>To what extent did stakeholders exhibit changes in behaviour towards XYZ?</li> </ul>	Inventory over time of stakeholders that were affected vs able to influence the LL Changes in stakeholders' level of awareness, familiarity with process and indented outcomes

## ITEM A.12

Westerlund, M.; Leminen, S. & Habib, C. 2018. Key constructs and a definition of living labs as innovation platforms. Technology Innovation Management Review 8(12): 51-62 <http://doi.org/10.22215/timreview/1205>

The authors contribute nine constructs that characterize living labs as innovation platforms (p.55):

The authors conclude with a new LL definition that emphasizes them in terms of the innovation platform: *"A living lab is a sociotechnical platform with shared resources, collaboration framework, and real-life context, which organizes its stakeholders into an innovation ecosystem that relies on representative governance, open standards, and diverse activities and methods to gather, create, communicate, and deliver new knowledge, validated solutions, professional development, and social impact."* (pp. 56-57)

**Table 1.** Emergent constructs from living lab cases

Construct	Definition	Scope
Objective	The positive impact that the innovation output is expected to produce	Collaboration, social impact, business development, economic development, user impact, test bed
Governance	A structural or procedural model by which decisions for the innovation projects, process, or organization are made	Managerial process, managerial structure
Openness	Mindset of the organization that is reflected in their level of openness and collaboration	Innovation culture, intellectual property rights
Stakeholders	Entities that add value to the living lab	Participants and their role
Funding	The means by which the living lab financially supports its innovation activities	Public funding, private funding, revenue stream of living lab's business model
Values	The benefits the stakeholders gain from their membership and participation within the living lab	Product outcome, social value, business development, validation, resources, networking, knowledge, investment, and marketing
Communication	The channels, technology, and techniques used to network stakeholders for information exchange	Online presence, media presence, person-to-person interaction
Infrastructure	The necessary resources and specialized equipment required to carry out the innovation activities	Software tools, hardware, sensors, facilities
Methods	The procedural steps used for the inception, development, and deployment of innovation	Attracting participants, ethics, motivational rewards, user support, data collection, idea generation, design, testing, and commercialization

## Take-aways for UFE

- The nine constructs can guide in the definition of evaluation uses/purposes
- Both the definitions and the scope statement above can assist in formulating key evaluation questions

Evaluation USE	Key Evaluation Question	Evidence needed
To review the funding status and seek additional sources of revenue	<ul style="list-style-type: none"> <li>• To what extent is the funding balanced between public, private and other sources?</li> <li>• What elements or components of the innovation have potential for private sector adoption?</li> </ul>	<p>A SWOT exercise on the different sources of funding</p> <p>A differentiation between innovations that require private sector adoptions vs public / not-for profit support</p>
To review and improve communication	<ul style="list-style-type: none"> <li>• To what extent have the media combinations and channels reached the different target audiences?</li> <li>• What have been the most and least effective moments of learning and how were they supported or not by communication?</li> </ul>	<p>A review of the communication strategy, with feedback from sample audience representatives</p> <p>Review of critical events and the types of communication supports that were noticed / missing</p>

**ITEM B.1**

Dekker, R.; Geuijen, K. & Oliver, C. (2021). Tensions of evaluating innovation in a living lab: Moving beyond actionable knowledge production. *Evaluation* 27(3): 347-363. <https://doi.org/10.1177/1356389021997848>

The authors “conclude that evaluation should be an explicit part of the broader design concept, and while generative experimenting can produce actionable learning, evaluation should also aim for academic learning, in a manner that is both democratic and robust.” (p. 348) They add that “...most studies of co-creation and co-production identify the contexts and factors which influence the success of the process, but that hardly any attention is paid to the outcomes or generalizability of factors.” (348)

- The authors emphasize the importance of generating actionable knowledge. They mention Developmental Evaluation that supports efforts at ‘trying things out’ (Patton).
- There is a reference to developing theories of change – as an example of theory-driven evaluation.
- There is a reference to inherent tensions between supporting innovation by contributing to actionable knowledge-building, while also harnessing the potential of producing academic knowledge, that in turn would focus on questions of merit and scalability (demanded of by funders).

Table 1 provides a summary of the data collection methods and sampling that were utilized, including ethnographic research.

**Take-aways for UFE**

- Consistent with developmental evaluation, the evaluators sought to provide timely, utilization-focused feedback
- The evaluation was a recurrent process, where they would report on their activities and early findings, including an interim report
- By using developmental evaluation, they became reflexive in their approach

**ITEM B.2**

Mastelic, J.; Saharkian, M. & Bonazzi, R. 2015. How to keep a living lab alive? *Info DaF* 17(4): 12-25. <http://dx.doi.org/10.1108/info-01-2015-0012>

The authors explored how Living Labs might be evaluated, building on the current efforts of the European Network of Living Lab (ENoLL).

They complementing their existing criteria with elements from business model development strategies – specifically the Business Model Canvas (BMC) – Figure 1. They identified three elements missing from current ENoLL evaluation criteria: identification of the cost structure, customer segments and the revenue stream.



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The 20 ENoLL evaluation criteria were spread over the 8 sections of the BMC:

- Evidence of co-created values from research, development and innovation.
- Values/services offered/provided to Living Lab actors.
- Measures to involve users.
- Reality usage contexts, where the Living Lab runs its operations.
- User-centricity within the entire service process.
- Full product life-cycle support – capability and maturity.
- Living Lab covers several entities within the value chain(s).
- Quality of user-driven innovation methods and tools.
- Availability of required technology and/or test beds.
- Evidence of expertise gained for the Living Lab operations.
- Commitment to open processes.
- Intellectual property rights (IPR) principles support capability and openness.
- Openness towards new partners and investors.
- Business– citizens– government partnership: strength and maturity.
- Organization of Living Lab governance, management and operations.
- The business model for Living Lab sustainability.
- Interest and capacity to be active in EU innovation systems.
- International networking experience.
- Channels (e.g. web) supporting public visibility and interaction.
- People/positions dedicated to Living Lab management and operations

**Take-aways for UFE**

- The eight sections of the BMC can guide the selection of evaluation uses/purposes
- The 20 criteria, grouped under the 8 sections, can guide the definition of key evaluation questions
- The business focus may make the criteria less relevant to some agro-ecology LL contexts



## ITEM B.3

Mulder, I.; Velthausz, D. & Kriens, M. (2008). The living labs harmonization cube: Communicating living labs' essentials. The Electronic Journal for Virtual Organizations and Networks 10 (Special Issue on Living Labs).

One side of the cube corresponds with the six views:

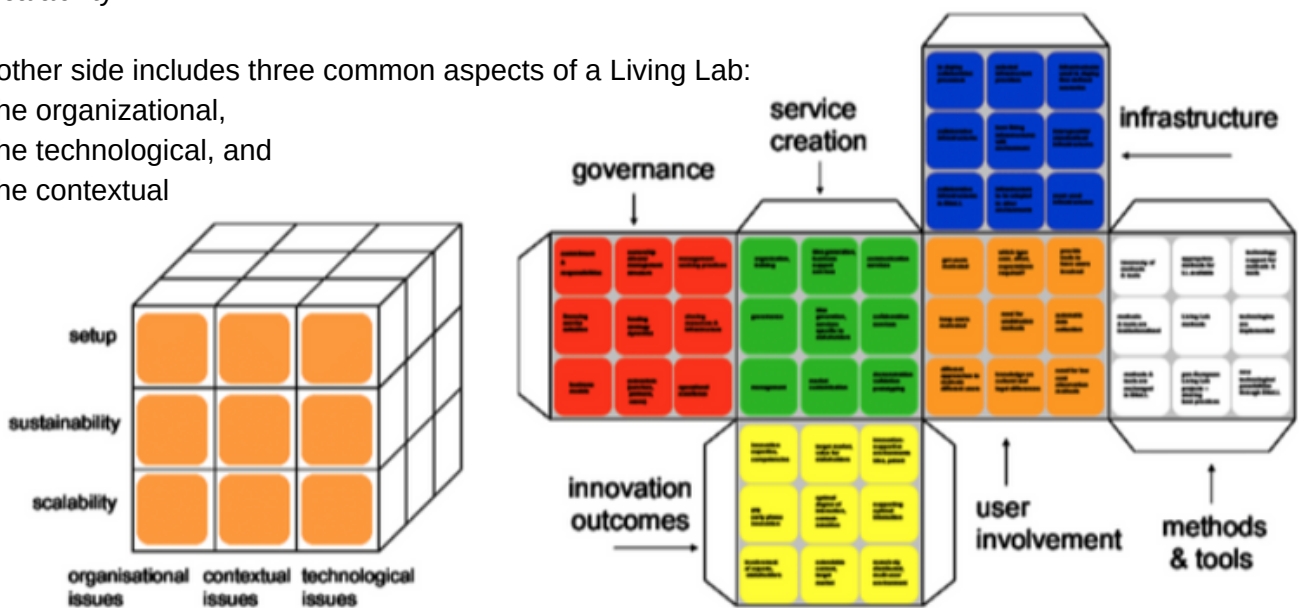
- user involvement (coloured orange),
- service creation (coloured green),
- infrastructure (coloured blue),
- governance (coloured red),
- innovation outcomes (coloured yellow), and
- methods & tools (coloured white).

Another side covers three development phases:

- setup,
- sustainability, and
- scalability

The other side includes three common aspects of a Living Lab:

- the organizational,
- the technological, and
- the contextual



**Figure 1: The Living Labs Harmonization Cube.**

The 54 items in the cube can become a guide for planning and operationalizing a living lab.

### Take-aways for UFE

- The cube provides a map for 6 broad evaluation uses and, for each one, 9 possible key evaluation questions, for a total of 54 possible KEQs
- The three development phases can help evaluation co-designers focus on the relevant stage to focus the evaluation on
- There is scope to further unpack outcomes (using a gradient, as in Outcome Mapping)

## ITEM B.4

Ondiek, M.A. & Moturi, C. 2019. An assessment of the sustainability of living labs in Kenya. *Innovation & Management Review* 16(4): 391-403  
<https://doi.org/10.1108/INMR-08-2018-0058>

This paper refers to four types of capital derived from the Sustainable Livelihoods (SL) Framework (human, financial, environmental, and manufactured) and follows the original OECD evaluation criteria (relevance, efficiency, effectiveness, utility and sustainability). The authors link the criteria to the project needs, objectives, inputs, operations, outputs, results, and impacts.

- The authors differentiated several types of objectives: operational objectives (linked to outputs); specific objectives (referring to long-term results); global objectives (referring to long-term impacts).
- The authors then refer to outputs and return to using outcome terminology. They differentiate results (immediate effects of the project) from impacts (longer-term, beyond the immediate effects).

In this evaluation design, the integration of the SL framework and the OECD evaluation criteria appears to be incomplete. Instead, the evaluation attempts to cover them all without clarity on the uses or evaluation questions. This article serves as an example of the application and limitations of the OECD criteria for LL evaluation.

**Take-aways for UFE**

- Take-aways for UFE
- The paper is unclear with regards to the trajectory of change; something where both a Theory of Change and/or an Outcome Mapping approach would clarify the gradient of change.
- The OECD criteria as used in the conceptual framework do not provide guidance to UFE design

## ITEM B.5

Ståhlbröst, A. 2012. A set of key principles to assess the impact of living labs. *Int. J. Product Development* 17(1/2): 60-75.

This paper is focused on the 'impacts' of living labs, and suggests five principles for living lab operations that can guide their assessment:

- Value: "...support value creation in at least two different ways: for their partners (e.g. SMEs) in terms of business value; and for the presumptive customer or user of the developed innovation in terms of user value." (p.63)
- Openness: "...openness is concerned with opening up the innovation process with a flow of knowledge in two directions: inflow and outflow. The outflow of knowledge implies innovation activities that focus on leveraging existing technological capabilities outside the boundaries of the organization. Inflow of knowledge relates to innovation activities that focus on capturing and benefiting from external sources of knowledge" (p 66)

- Realism: innovation activities should be carried out in a realistic, natural, real-life setting
- Influence: *“Living labs need to manage how to assure that participation, influence and responsibility among different partners are balanced and harmonised with each other and with the ideology of the user influence of the project.”* (p65)
- Sustainability: *“Focusing on the sustainability of the living lab highlights aspects such as continuous learning and development over time.”* (p.64)

The authors conclude that: *“Living labs lie at the intersection between technology development, business development and technology use. It is both an innovation and social construct that deals with ideation, analysis, constructs, deployment, use, evaluation, and management of innovation in every day contexts. Within this setting, living labs are proactive with respect to innovation.”* (p.72)

#### Take-aways for UFE

- The five principles can assist primary users / owners of a UFE design to think about themes or dimensions that could be translated into evaluation uses or purposes
- The article does not include key evaluation questions based on the principles