

Place-based evaluation in Living Labs: designing tools for collective learning.

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Abstract. Living labs in agroecosystem transition contexts have gained significant popularity, yet little scientific attention has been given to monitoring and improving these institutions, including the process of setting them up. As suggested by the literature, it is imperative that research agendas be established to effectively evaluate such living labs, taking into account the challenges of interventions in different contexts and the participation of local actors in the evaluation process. We critically inspect the implementation of a living lab's monitoring, evaluation, and learning process in the context of a "One Health" project, *Santés & Territoires*. The project involves six living labs established after local actors identified the main challenges related to socio-ecological health issues. Transversal to the national specificities, a fourfold multi-component monitoring, evaluation, and learning process is being proposed : (1) a protocol of observation of collective actions taking place during living labs, (2) a set of semi-directed interviews with facilitators and focal points to gather their personal experiences and standpoints of the living lab process, (3) the creation of field notebooks through iterative and collaborative efforts with local actors and investigators, and (4) satellite approaches reflecting program/project-oriented evaluation and local living lab capacities. We discuss the challenges of implementing such interdisciplinary/transdisciplinary research and participatory action research approaches in a project-based society. We take a reflective and situated perspective on the limits and opportunities for improving the monitoring and evaluation of living labs. Our argument is that it is important to understand changing local contexts in order to systematically refine tools adjusting to emerging needs of the participating population, in particular under the utilization-focused developmental evaluation framework. Lessons learned that involve continued iterative process of monitoring and evaluation, issue-driven process, and ongoing improvement of monitoring and evaluation interventions are sketched. This could provide foundations for research and practice, supporting the development and testing of monitoring and place-based evaluation tools for living labs implementation.

Keywords. Agroecosystems Living Lab, Monitoring, Evaluation and Learning, Utilization-Focused Developmental Evaluation, Collaborative Design, Situational Analysis.

Introduction

The ongoing crisis affecting both our societies and environments, echoed through climate change, agricultural encroachments, biodiversity loss, and the recent pandemic, calls for a closer examination of how these factors are interdependent and examine their relationship from a socio-ecological perspective (Cumming et al., 2006, 2013; Cunningham et al., 2017). In situations where there are notable uncertainties, it is important to not solely focus on detailing them. Rather, we should also take into account the intricate nature of these uncertainties (the complexities) and work consciously to address them effectively (Morin, 1990). As such, the socioecological approach is crucial for configuring the One Health framework, especially in the current global context where there is a pressing need for agroecological transition to deal coherently to socioecological crisis (De Garine-Wichatitsky et al., 2021; Deguine et al., 2015; Zinsstag et al., 2011). The One Health framework is critical in enhancing our comprehension and strategy for an agroecological transition. It prioritizes health and highlights it as a shared objective to be achieved through agroecology. Including health considerations in agroecology aids in making informed choices and taking action. Although health is a crucial aspect of the discussion around agroecological transition, it is seldom evaluated on a territorial scale focusing on those who adopt agroecological practices (see, for instance, Loker & Francis, 2022). The state of health of a given territory can be used as a Common to decide what actions should be taken as part of the agroecological transition (Berthet et al., 2022; Felcis, 2021).

The agroecological transition offers a space to promote the *praxis* of sustainable agriculture and, consequently, the transformation of food systems (Altieri et al., 2017; Nicholls & Altieri, 2018). It inherently involves the reflection on transformative epistemologies and participatory approaches for research and development (Frank et al., 2022; Sachet et al., 2021). Concretely, the agroecological transition considers the importance of the modes of stakeholder interactions, arranging their level of participation, and consolidating and capitalizing standpoints and experiences for improving mutual learning and consensus decision (Barrios et al., 2020; FAO, 2020; Tittonell, 2019; Wezel et al., 2020). Therefore, the definition and implementation of the agroecological transition should be the outcome of consultations based on a collectively constructed vision of a desirable future that is inclusive of everyone and grounded in the realities of a specific area (Binot et al., 2015; Duboz et al., 2018; Rossing et al., 2021).

Envisioning a –One-Health based agroecological transition means then integrating research into democratic decision-making in the context of post-normal science (Funtowicz & Ravetz, 2020), implying the inclusion of non-academics in the process of constructing research problems, questions, and analysis, and in the design of solutions (Fals Borda, 2013; Kindon et al., 2007; McTaggart, 1997) and in their evaluation (Fetterman et al., 2014; Luederitz et al., 2017; Rossing et al., 2021). Berthet et al. (2022) emphasize in their discussion about the researchers' role in the collective design of sustainable socio-ecological systems that involving diverse and autonomous stakeholders in longer term processes is a demanding task requiring frequent communication and adaptation. This reflects crucial questions from participatory action research about 1) who to involve in the process (from the design to the analysis and the utilization of results), 2) the positionality of each stakeholder (notably the researchers), 3) the duration of research and each parties' commitments, among others (see McTaggart, 1997, Chapter 2).

According to a recent systematic review, transitions that encourage collective action and learning are highly effective in promoting sustainability, notably through the approach of the "citizen-centered lab" commonly known as living lab (Gamache et al., 2020). McPhee et al. (2021) conducted a study identifying the essential features of living labs in agro-environmental projects by analysing multiple case studies. They established that an "agroecosystem living lab" is defined by a) its goals – the promotion of sustainable agriculture and food systems, b) its activities – innovation cycles, evaluation and data management, and scaling up and out outcomes –, and 3) its participants, – diverse stakeholders, mainly from the public sector and academic institutions. Thus, living labs for agroecosystems involve collaborative approaches to develop knowledge, innovations, and practices for a sustainable transition by establishing spaces for multi-stakeholder engagement within a specific context. According to Beaudoin et al. (2022), living labs are both a research methodology and an infrastructure that involves the participation of various stakeholders throughout the research, development and innovation process, including designing and implementing experimentation and innovation and evaluating their outcomes. Living labs can be seen as institutions encouraging learning and empowerment, aiming to become autonomous over time by breaking away from research programs that often initiate them (Alami & Cornu, 2022).

Like most projects implementing living lab, a significant challenge is posed by context-sensitive monitoring, evaluation, and learning that captures the collaborative design of such processes and consequently broad evaluation purposes (Beaudoin et al., 2022). Some studies have highlighted the lack of standardized methods for monitoring and evaluating information and knowledge used and produced in designing experiments for transitions in living labs (Ballon et al., 2018; Beaudoin et al., 2022; Bronson et al., 2021). The task is challenging because these emerging institutions vary in many ways, particularly in diverse regional contexts. Consequently, the topics chosen by these collaborative spaces and the way these institutions are governed and steered also differ (Alami & Cornu, 2022). Therefore, living labs pose inherent difficulties to the monitoring and evaluation process due to their iterative feedback loops, limited causality, broad scopes of intervention, and potential spill-over outcomes (Ballon et al., 2018; McPhee et al., 2021). As living labs are growing initiatives in agroecosystem research, how to evaluate their emergence, their outcomes, and their governance for processes involving a transition to new “states” (sustainable agriculture, agroecology, etc.)? Or, put differently, how does the way living labs are implemented affect the outcomes of the transitions they promote?¹. Such questions are striking for monitoring and evaluation purposes and uses, as living labs possess features of the complexity sciences, such as nonlinear logic, working with uncertainties and multiple scales and level.

Concretely, evaluation is an essential aspect of research and development projects. Monitoring and evaluation, when embedded in project activities (or living lab activities) support implementation steering according to emerging changes and needs. In other words, it becomes crucial to understand whether living labs have an impact on the project actions and implementations, and whether any solutions could be overlooked due to the living lab's influence. Through a scoping literature review and a series of questionnaires and group interviews, Beaudoin *et al.* (2022) gathered various perspectives to construct and validate with experts (living lab practitioners and researchers) a research agenda for evaluating living labs, in particular in the context of sustainable agroecosystems. They summarize themes and sub-themes and the guiding questions that researchers should put forward for designing LLs' monitoring and evaluation systems. As such, it is not a framework with crucial evaluation questions to use or not, but more a guideline on what approach evaluation could be in the context of agroecosystem living labs. They suggest that living labs' evaluation should move away from top-down methods and control to more community-inclusive approaches, and consequently be coherent with the living labs' participatory and collaborative design approach.

One evaluation framework offers a space to address inherent features of the living labs, as it does not prescribe any particular approach or theory: the Utilization-Focused Evaluation (UFE). One fundamental principle is that such evaluation should be assessed by the usefulness of the evaluation results for its intended users and uses. Put it differently by Patton (2008, p.37): "Therefore, the focus in utilization-focused evaluation is on the intended use by intended users." The UFE is not a set methodology but rather a decision-making framework that provides guidance through several steps (Ramírez & Brodhead, 2013). Such guiding steps would diminish the tension in the search for a universal and standardized framework for living lab evaluation. Within UFE, Developmental Evaluation (Patton, 2011) aims to support innovation development with an adaptative framework for complex environments where the measurements and monitoring are evolving along the process. Developmental Evaluation therefore attempts to capture the dynamics of evolving goals in a development project (J. Gamble et al., 2021; J. A. A. Gamble, 2008; Patton, 2021). Under such premises, the evaluation becomes an adaptive learning process that focuses on the needs, feedback, uses and evaluation decisions of evaluation users and adapts accordingly. These are monitoring and evaluation approaches characterized by a high degree of flexibility and therefore difficult to standardize as they focus on capturing emerging outcomes. This

¹Many studies on living labs seem to assume that such institutions allow for creating space for collaborative design under the shibboleth of participation and user involvement, but do not clearly evaluate them in depth. As such, some important evaluation questions seem to be omitted, especially regarding the power dynamics of participation (e.g., who decides to make living labs? Who decides to include or exclude individuals in the participations? etc.) and the effects of the context in the living lab institutionalization (e.g., how does such a locality trigger or hinder the living lab in terms of politics? What group of stakeholders is more likely to be involved in the living labs?) It's true that such inquiries are ones that some more in-depth investigation might address, and the present authors aren't pretending to do so. Nonetheless, we believe that in the context of the monitoring and evaluation process, it is imperative to consider such inquiries, as evidenced by the findings of the study conducted by Beaudoin et al.

means creating a plan for evaluation with the people who will be using the evaluation process (evaluation users in UFE, see Patton 2008; Ramírez and Brodhead 2013). When it comes to living labs, UFE can provide a useful tool adapted to the complex and unpredictable nature of these collaborative environments considering their institutional setting.

Such an evaluation approach can tackle a gap in the evaluation of agricultural research projects, which is the involvement of local stakeholders, particularly marginalized groups, (as in diffusionist agricultural extension approaches, see Landini, 2016). While living labs have gained attention in environmental and agricultural research and development projects, there are limited experiences in monitoring, evaluation, and learning (MEL) within these projects. Recent efforts have established research agendas for constructing MEL among living lab actors and for collaborative science-society initiatives (Beaudoin et al., 2022; Luederitz et al., 2017), but few concrete experiences reflect on the evaluation process of multiple level and scale of living labs assessing co-designed field experiments, the processes of living lab institutionalization (i.e. its emergence as a local institution), as well as the overall projects implementing the living labs. This article aims to contribute to the growing literature on agroecosystem living labs, their evaluation readiness and their MEL process, notably by documenting and analyzing the construction of a place-based monitoring and evaluation dynamic in the context of six emerging living labs in six locations, influenced notably by several evaluation frameworks, but mainly constructed with the inclusion of MEL users. In order to do so, we critically inspect the design and first steps of implementing living labs' MEL system in the context of a One Health project in selected locations of West Africa and South East Asia, *Santés & Territoires*.

The *Santés & Territoires* project

The "*Santés & Territoires*" project ("Health & Territories," further mentioned as S&T) strives to accompany the transition by mobilizing participatory sciences, transdisciplinary approaches, and systemic modeling to achieve this desirable state of health. By answering how the shift towards agroecology can contribute to improving public health through an integrated approach of all health aspects, the S&T project aims to enhance the quality of life and well-being of the local population. Moreover, to ensure the appropriation of the agroecological practices, they need to be defined, tested, and validated by the beneficiaries. In all its intervention areas, the S&T project collaborates with local communities to determine their perception of the health of their territory based on human, animal, plant, and environmental health dimensions.

To adopt such an iterative and evolutive approach of co-analysis of problems and codesign of solutions, the S&T project accompanied the implementation of six living labs in different locations, namely two in Senegal, two in Benin, one in Laos, and one in Cambodia (Figure 1). These living labs act as experimental facilities for new agroecological practices, tools, knowledge, norms, discourses, and the institutional arrangements accompanying them (as in McPhee et al., 2021). They are designed to facilitate structured dialogue and collaboration between local stakeholders and scientists to co-create solutions for the agroecological transition, tailored to the specific needs of each context.

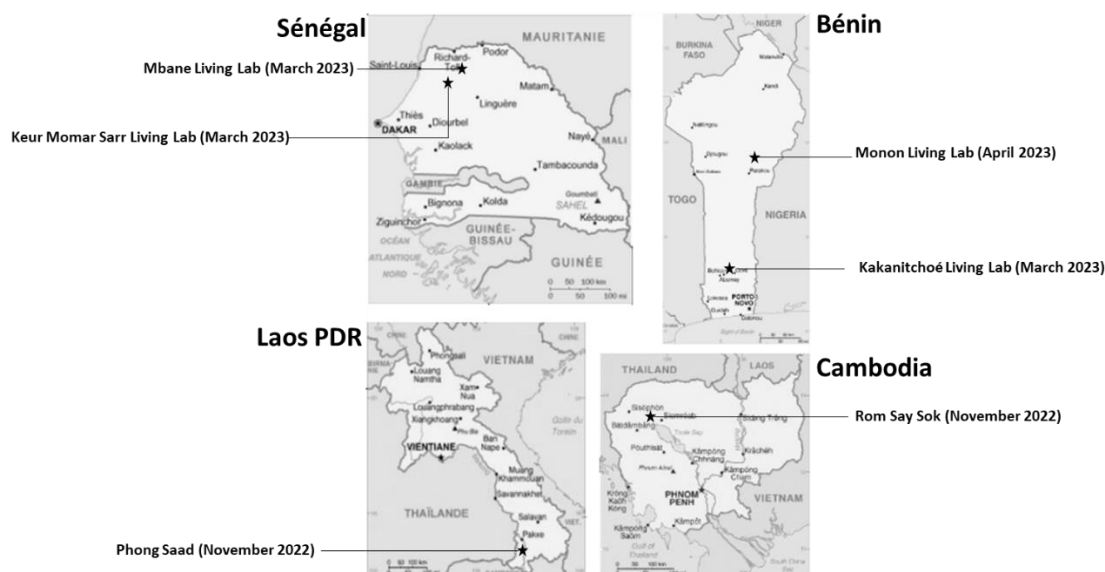


Figure 1. Location of the S&T living labs with their launching date.

The S&T project's living labs open the space for two primary areas of work: collaborating to design experiments and interventions, and establishing, operating and sustaining a community of practice. Experiments and interventions in Senegal concern the *Lac de Guiers* region, where various agricultural production systems rely on the lake water for crop and livestock management (Ba & Diakhaté, 2021; Benegiamo, 2020; Tall et al., 2022). The areas and resources around the lake are limited and subject to ongoing competition from a variety of intensified farming methods, agribusinesses, and family-run farms. This results in various health issues, including chemical residue contamination from agricultural inputs, nematode infestation of crops, bilharzia, and parasitic illnesses in livestock. Two living labs have been settled, one in the lake's northern region (Mbane) and the other in the southern region (Keur Momar Sarr).

In Benin, one living lab settles in the Parakou area of Benin, in the municipality of Monon, where cotton, cashew nuts, and cereals are primary crops. Another living lab is located in Kakanitchoé, which has a diverse range of agricultural farming. Livestock farming is also significant in both areas, particularly transhumant livestock farming. Unfortunately, there is a risk of Lassa fever resurfacing and contamination of pastoral resources due to the use of chemical inputs from the cotton system. The intervention modalities have been codefined within the framework of support focus on preventing the risk of African swine fever transmission.

In Cambodia, in the Battambang province, the living lab promotes interdisciplinary and participatory work to prevent and manage risks associated with viruses carried by bats, such as Coronavirus, Nipah virus, and Lyssavirus of rabies. Additionally, the lab also explores agroecological issues, such as the use of bat guano as a fertilizer and the ability of bats to regulate crop pest insect populations. In Laos, in the provinces of southern Laos, the living lab supports the interventions to implement an integrated management system for extensive pig farming. This approach focuses on biosecurity at the village level, with a specific emphasis on preventing the transmission of African swine fever.

Linking up the various geographical sites is done by animating a community of practice, including the protagonists of related projects. The aim is to enable exchanges between stakeholders linking a local One Health approach with the agroecological transition. This project component focuses on sharing conceptual frameworks, tools, methodological approaches, training opportunities, and cross-disciplinary scientific events involving non-academic persons. This way, it creates a space for disseminating innovations promoted by the S&T project and enhancing local stakeholders' skills and capabilities to consider health-agriculture interactions. This work area is also where the reflection on the monitoring and evaluation of the living labs is taking place. We proposed and deliberated various tools with project members and local partners to create a comprehensive and useful evaluation for each distinct context.

Tools designed for the monitoring, evaluation and learning in S&T

The monitoring and evaluation process of the S&T project is part of a specific project work package, which accompany the consolidation of concepts and the generalization of practices that contribute to all

expected changes in the diverse socio-ecological and territorial contexts. In other words, the MEL component objectives are to contribute to strengthen participating stakeholders' skills and knowledge, particularly in their comprehension of territory health and how it links to institutional issues and methodological pathways. Furthermore, this collaborative MEL supports building a community of practices where the idea of common is based on an exchange of practices and access to tailor-made training and support services.

The MEL component of the project involves three nested dimensions. The first dimension is project-wide, which requires the MEL team to develop indicators that are suitable for an interdisciplinary approach and follow utilization-focused developmental evaluation guidelines (Gamble 2008; Patton 2021). This dimension aims to provide a global view of the project's progress in terms of outcomes identified by users for their intended uses, and report on the learning and collaborative innovation processes engaged. Directly connected to this level is the living lab level. The living labs MEL reflects on the different approaches and pathways taken, including design, governance, and collective highlights (i.e. workshops, living lab forum and so on) where the evaluation would provide guidelines for decision-making to local coordination teams and specific stakeholders. The third dimension is the intervention dimension, which focuses on assessing the use and interactions of the interventions as well as the intervention impacts generated through the living labs' actions and whether the living labs have helped achieve the desired results. This latter dimension concerns all stakeholders of a specific intervention generated from the living labs, notably researcher and people who benefit from the intervention.

At each level, stakeholders collaborate to develop an agenda for MEL interventions and determine evaluation uses and intended users, evaluation objectives and questions, the necessary tools and learnings sought. Currently, at the initial stage of the S&T project, three primary tools have been created: (1) a collective highlights observation, (2) systematic semi-directive interviews with living labs' focal points, and (3) co-constructed notebooks for each intervention evaluation. Moreover, specific living lab implemented complementary approaches to reflect upon targeted outcomes and capacities of stakeholders that will be generated by the living labs' actions.

1. Observation of collective highlights

This tool helps to observe interactions during collective highlights. We define the collective highlights as a critical juncture where, in the context of the living labs, stakeholders will engage with the actual execution of a living lab service, which can be a singular instance or a series of interactions. During such collective highlights, stakeholders' interactions can serve as a pivotal point to underline the quality and the effectiveness of the life of the living labs, its emergence, its organization, its governance. As the inherent features of agroecosystem living labs, such collective highlights take form as what is generally called workshops, forum, steering committee, and so on i.e., spaces created for the search of interaction between several project stakeholders. Such definition is parallel of what is called by Ramirez (2010) a "moment of truth". However, moment of truth highlights incidents where a significant change occurs or something that may be missed and yet signals a shift as an emergent outcome. It is important to note that the success of the "moments of truth" approach requires a collaborative effort between all stakeholders of a certain service (from services providers to services users, in our context all living lab around a specific event). An important point of the "moment of truth" or collective highlight is that it should not assume that all outcomes and results can be predicted, but instead work in identifying areas for planning, improvement and implementation of solutions.

As such, the observation of collective highlights is a tool that should render speech taking, the emergence of a committee, among others, during collective highlights within living labs. This method involves identifying specific elements to observe based on the goal of a specific collective highlight (Figure 2). The process is a standard observation technique based on ComMod's² experience with serious game observation (Daré et al., 2020).

² The ComMod group applies various techniques and methods within the companion modeling approach. It includes utilizing multi-agent-based models and role-playing games to simulate and represent socio-ecosystems' functioning. The purpose is to facilitate the study of coordination processes between actors and collective decision-making while crossing disciplinary boundaries.

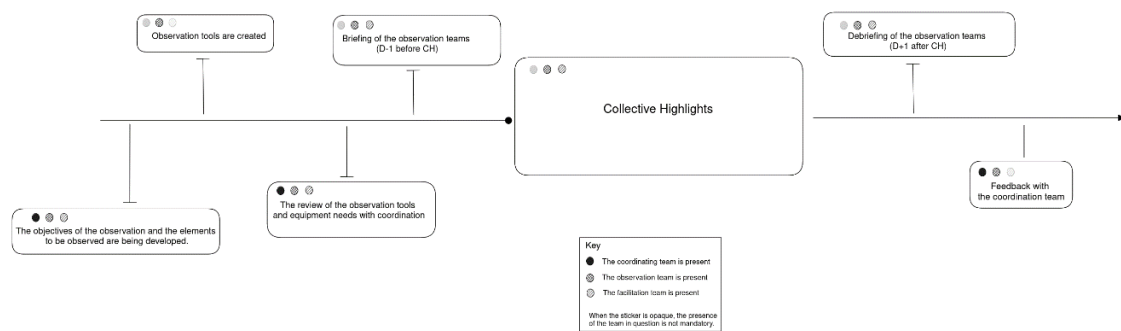


Figure 2. General overview of an observation cycle within the project S&T.

Before conducting an observation, the observation team, constituted of primary users of the evaluation and the coordination team (as companions), prepare the necessary tools based on the objectives of the collective highlights and the given observation objective (according to evaluation uses and evaluation questions). Once the team agrees on the objectives, they can determine the various elements to be observed. For example, if the collective highlight aims to promote knowledge transfer and foster learning, the observation protocol will focus on key elements that demonstrate or contradict these goals. After deciding on the elements to be observed, the observation tools are designed and validated in a final meeting. The team then conducts the observation during the collective highlight and shares the data collected afterward. During the debriefing, it is then discussed what data are crucial for monitoring and evaluation of the living labs and the project as a whole.

The protocol divides tasks among different groups (see patches in Figure 2). The observation team participates throughout the protocol, while the coordination and facilitation teams participate only at specific moments unless otherwise required. The observation team is in charge of observing during the collective highlight. As such, they are responsible for preparing the observation tools, which include preparing observation tools such as observation grid, questionnaires, notebooks, and recording materials, and organizing the collected data. The facilitation team represents the persons in charge of the collective highlights, for instance, meeting/workshop facilitators. Their role is more about accompanying the observation team to know what will be observed and review the process with the whole group. The coordination team oversees the overall process and ensures the protocol is on track. Initially, this team comprises S&T project members from CIRAD Institute but may include project partners as the project progresses. For instance, in Senegal, the observation team is being formed under the coordination of CIRAD researchers and project members and will implement the observation tool during each collective highlight. In contrast, the CIRAD team will have a facilitation and consultative role at the end. The final step of the protocol, the validation of the data, i.e., evaluating what are the crucial data for the MEL of the living labs and the project, is made with the whole team and can be used as a space for reflecting on what can be done with the data collected to feed the decision process of the living lab.

2. Living memories of living labs – frequent semi-structured interviews with focal point

A set of semi-directed interviews, called Living Labs Living Memories, is designed to document the emergence of living labs, their institutional set-up, actors' interactions and organizations, and the perceptions of these actors on the institutionalization of living labs. These interviews will complement the observation of collective highlights by tracing the happenings between them. The interview process should last approximately one hour with focal points of living labs. The focal points are persons connected to the living labs locally, mainly project members that participate actively to the setting of the living lab, the facilitation/coordination of activities in the living labs at the local setting. However, as a type of snowball sampling, some other focal point can be spotted as some actors can show up as important actor in the life of the living labs. Such persons are recommended by the focal points.

Regular interviews with focal points are crucial, ideally every three months, depending on upcoming and recent activities. The topics discussed are adaptable and contextualized within the framework of living labs, utilizing a chronological perspective of past events and collective highlights. The interview guideline follows a semi-directed approach, with a series of theoretical and interview questions developed to ensure comprehensive coverage of the main and sub-themes (Wengraf, 2001). However, in the context of the MEL objective for the project, an additional level is incorporated in the interview

guideline: the utility of the question. For instance, a set of questions such as “How do stakeholders perceive the emergence of the living labs so far?” or “What are stakeholders’ expectations going forward?” (theoretical questions or key evaluation questions), the utility of such set of questions should improve the communication among the living lab stakeholders and adjust its outcomes. When constructing such an interview guideline, the goal is to take a step aside from the interview standard and construct an ad hoc one, to say, an interview guideline where the discussion process and the results should be reflected directly in the activities of the living labs. Therefore, the results of these interviews will be used to meet specific needs in the functioning of living labs. In essence, the interviews are tailored to meet the needs of the living lab and enable specific actions to address these needs identified during the interviews.

3. Living lab notebooks – evaluating interventions with living lab actors

The third tool is called the Living Labs notebooks, which allow for MEL of interventions conducted through the living labs. It is a participatory MEL developed by both the experimenters and stakeholders involved in the intervention. Each intervention co-designed through the living labs will have a specific MEL protocol tailored to it. The process involves breaking down the different intervention phases to accordingly plan MEL activities and thus co-identify relevant indicators for the intervention itself, as well as for the intervention process and the living labs impact on this intervention process (Figure 3). The general protocol of this approach is based on cycles of action-research where phases of action/field work and phases of reflection and reflective feedback are codesigned (Kindon et al., 2007; McTaggart, 1997).

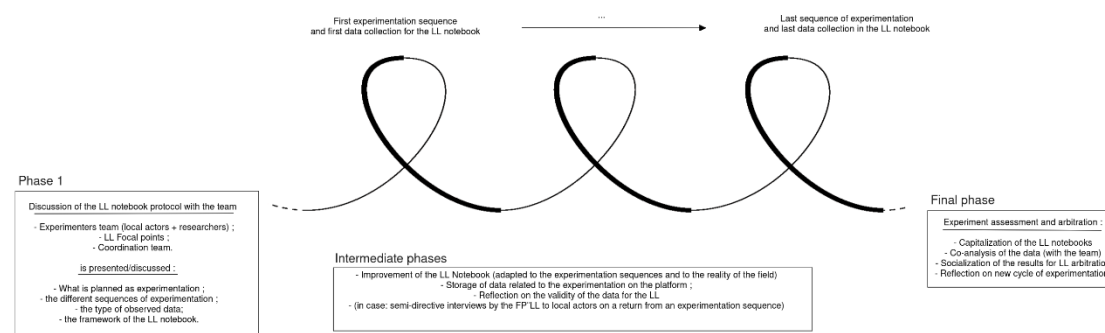


Figure 3. General overview of the living labs notebook protocol

The initial stage involves having a discussion with the "experimentation team," which includes researchers and local stakeholders taking part in the intervention. During this phase, the planned experimentation protocol, the standard framework of the Living Lab notebook, and the data type expected are reported. The framework of the notebook is followed during the experimentation process, and different data collection phases are carried out. Consistent discussion with the experimentation team takes place during the various phases of experimentation, with the intention of improving the notebook, adapting it to the various phases of intervention, systematizing and loading data, and reflecting on the validity of the data for monitoring-evaluation of the Living Labs and the project as a whole. If needed, some semi-directed interviews are held with the participating stakeholders to obtain feedback on a specific intervention sequence. At the end of the intervention, the notebooks are co-analyzed with the various living lab stakeholders, i.e., the evaluation users.

4. Living Lab specific approaches

The S&T project, which spans four countries and involves the creation of six living labs, offers several approaches in addition to the current tools. One potential transversal approach has been conceptualized during the discussion with project team members and partners. This approach aims to be discussed with project team members and partners, involves creating a space for local living lab stakeholders to participate in collaborative MEL and PRAs-RRAs during specific collective highlights (see Chambers, 1994; Fetterman et al., 2014). Such space would allow to capitalize on the different interventions, ongoing and completed, and to evaluate with the participants the process of (co)designing the interventions, assessing the methods used, and the utility of the living lab as a space for (co)designing

such interventions, the governance of the intervention and the living labs and the outcomes expected and realized. In the same line as most of the tools, the results of these participatory activities directly reflect the life of the living labs, similar to Utilization-Focused Developmental Evaluation (J. A. A. Gamble, 2008; Patton, 2021).

Thanks to the assistance of the DESIRA LIFT project³, we have also initiated work on the theory of change and utilization-focused and developmental evaluation frameworks for the S&T project. It enables us to chart a straightforward course of action for the MEL, determine and communicate key performance indicators that will aid in tracking the project's progress, and develop an evaluation that sticks to the principle of the UFDE. As such, we are jointly devising a monitoring-evaluation system that will provide us with immediate feedback on the functioning of the living labs by the users of the evaluations, i.e., project partners. Our interactions have resulted in a mentorship dynamic with the LIFT team, which allows us to understand the ins and outs of such an evaluation.

More locally situated, another methodology complements the evaluation of living labs in Senegal. This is based on an in-depth analysis conducted by the inhabitants of the Living Lab territories, focusing on the changes in their perceptions, practices, and interactions concerning the health of their territory. It aims to construct a collective analysis of perceptions of health in the territories via a process of participatory action research based on the experience of Burns (Burns, 2018). The collective analysis of local health perceptions and dynamics serves as a reference situation. By repeating the collection of qualitative interviews at the end of the project, these indicators will make it possible to analyze the evolution of perceptions, interactions, practices and behaviors related to health in the area. Participatory monitoring will be carried out on an annual basis, through workshops attended by all those involved, enabling a collective participatory assessment to be made of what has happened over the past year, and to highlight any changes in perceptions, practices or interactions they have identified. The results will provide lessons on the initial effects attributable to Living Labs, which can be utilized to feed the project's monitoring system. They can also be compared with quantitative indicators of territorial health, such as agronomic, socio-econometric, ecological, etc. Furthermore, the results can be compared with the perception and practices of stakeholders.

³ <https://www.desiralift.org>

Starting to implement the tool in the different living labs

Setting up a MEL program within the framework of a living lab project can be quite a challenge, particularly when the project is limited by time and space constraints. As the S&T project is still underway, it is premature to evaluate the efficacy of MEL practices as the process is currently in the co-construction phase (a meta-evaluation in the UFE process, see Ramírez & Brodhead, 2013). Nevertheless, we can examine crucial aspects, limitations, constraints, and lessons learned and compare them with established literature. This will enable us to thoughtfully contemplate implementing the MEL tools being designed for the project.

As a crucial component of the S&T initiative, the initial stage involved implementing a diagnostic phase across multiple study areas. This phase was predominantly carried out in 2022. Following this, the living labs were gradually established and began taking shape in each area starting from the first half of 2023. These spaces facilitated interaction between different stakeholders through a method enabling the construction of systemic diagrams with the living lab stakeholders. In addition, they provided an opportunity to reflect with invited participants on developing a collective vision of the various health issues related to actors, resources, dynamics, and interactions (see Etienne et al., 2011).

These workshops provided an opportunity to test observation tools in Senegal and Benin, with the goal of supporting individuals in implementing them and receiving feedback. The initial use of the tools revealed that, while systematic, they require training or support to be used effectively. This was confirmed through discussions with partners in Senegal, who also emphasized the importance of forming a team for collective events. Pilot testing of the tools by students in Benin identified needs related to project understanding, workshop organization, and actor mobilization, which were further explored through semi-directive interviews. While modeling support workshops have been implemented in the Laos and Cambodia living labs, there is still a need to design monitoring and evaluation tools. Furthermore, understaffing among research teams and partners in these regions makes it challenging to implement such tools for the MEL of collective highlights.

The "living memories" semi-structured interview tool has been successfully introduced in Senegal, with promising progress. A pilot test was conducted with a project focal point, allowing for a thorough introduction to the methodology and obtaining valuable feedback on its usefulness. The co-design process was also discussed, covering all stages of a standard interview, from design to transcript analysis. While no direct feedback has been received at this stage, some observations during the interviews have been noted and will be further explored. During the pilot interviews, governance organization was raised as an important issue, particularly regarding the planning workshops with living lab stakeholders. These insights will be considered as the project moves forward. Living Labs are now up and running in other project countries, but the selection of focal points varies. In Benin, establishing contacts and validating hierarchies required significant effort due to the unique socio-political situation. Nevertheless, focal points have been identified and support is underway to set up living memory tools. A team of young experts has already conducted a pre-interview with one of the key points, providing an initial insight into the tools. Unfortunately, in Southeast Asia, we were unable to mobilize the living memories tool due to insufficient staff, preventing the identification of focal points for each living lab.

The Living Labs MEL project showcases varying degrees of commitment within each locality, as evidenced by the living lab notebooks, the third tool in the project. The Senegalese zone boasts an impressive number of CIRAD partners and agents, which is starting to have an impact on the living lab notebooks. Following the diagnosis and launch of the Living Labs, thematic groups were formed through shared vision workshops, as mentioned above, to address health concerns in the area. These thematic groups are responsible for defining the living labs' activities and planning. The living lab logbook is currently being designed in collaboration with each team. Our plan is to reach out to each thematic group and request that they assemble a team interested in carrying out the MEL of planned interventions. The ultimate objective is to provide effective interventions to those concerned about health in the area.

Situating our MEL plan

At present, and from a Utilization-Focused Evaluation perspective, the primary objective of the evaluation in S&T is to gain valuable insights and improve the establishment of living labs. However, as the project delves further into the process, further objectives and important queries may arise that

necessitate evaluation, notably in the context of emerging living labs (a developmental evaluation approach). Therefore, when we stick to the principles of UFDE, we can outline that the S&T coordinating unit is currently responsible for evaluation as the primary user and owner. However, in the future, there may be opportunities to engage evaluation users/owners from other countries and living lab teams and encourage them to propose evaluation objectives and tools that would benefit them. Thus, take an accompaniment posture for the MEL and stick further to PAR principles.

To effectively establish living labs in multiple regions/countries, it is essential to document and analyze the experiences of developing the evaluation process that the project facilitates in parallel with the emergence of the living labs. The developmental evaluation is a valuable approach that aids in comprehending a developing model (J. Gamble et al., 2021; Patton, 2021). By documenting and reflecting on the construction of the tools, the appropriation of the tools, and their utilization in itinere, the S&T evaluation plan would allow us to evaluate results, identify areas for improvement, and refine the living lab model. The UFDE process encompasses various activities, such as observing, gathering data, and analyzing outcomes. It also involves reflecting on experiences and detecting challenges or obstacles. By doing so, the users of the evaluations and the designer can better understand the living lab model and make informed decisions to enhance the process. The key is integrating them into this learning process by doing the living lab stakeholders so they can participate in informed decisions to enhance the living lab settlement and sustainability. This approach and position align well with the DE method, a positive step towards effectively implementing the living lab model or improving the model in the making.

The living lab harmonization cube, which was proposed by Mulder et al. (2008), presents a multidimensional approach that allows us to describe and situate the different phases of living labs. From there, it is also possible to draw a parallel between implementing living labs and implementing their MEL, i.e., to situate the current state of the MEL in parallel to the implementation of the living labs. Currently, the S&T project is in a setting up phase where several living labs and consequent interventions are designed, which will be carried out in parallel. According to the space-time axis proposed by Mulder et al. (2008), S&T living labs are at the end of the set-up and sustainability phases, where living labs gradually are institutionalized and self-adjusting labs, considering each region's unique dynamics.

Therefore, the ongoing S&T project is entering a crucial phase, where the project team is dedicating efforts towards identifying the most relevant users for planning and implementing the MEL. This phase is of utmost importance and presents a challenge, as the project team must determine the MEL users who are most motivated to use the approaches and tools for the living lab. The project team needs to clearly understand who the MEL users are, how they intend to use the tools and the evaluation results, and how these factors relate to the MEL's design. The team must develop tools that encourage user participation, provide training or accompaniment, and gradually introduce collaborations based on stakeholders' capabilities and defined roles. This phase aligns with UFDE principles (J. Gamble et al., 2021) and is essential to ensure that the approach and tools are well-received and utilized by motivated MEL users.

The project team is also beginning to categorize the tools and assess their suitability for different living labs. The task encompasses evaluating the tools' effectiveness in meeting the living labs' and MEL users' needs, thus gradually rolling out collaborations according to stakeholders' capabilities and defined roles. The project team is determining how the tools can be customized to meet different user requirements. In addition, the current phase of the S&T project is critical, as it serves as the foundation for implementing the MEL plan and reinforcing the viability of living labs.

As such, the next steps will be to identify the potential evaluation uses and key evaluation questions with the different users of the evaluation, in particular within the living lab notebooks. In order to elicit with stakeholders, the key evaluation questions, it is essential to engage in productive negotiation and have a deep appreciation for diverse perspectives and assumptions. This means actively listening to the opinions and experiences of stakeholder, acknowledging and addressing any conflicting viewpoints, and fostering an environment of open communication and collaboration. Utilizing the UFE framework as a decision-making tool and action-research principles, it will enable MEL teams to effectively navigate complex problems and make informed decisions based on a thorough understanding of the issue at hand. By taking the time to elicit the evaluation question and engage in a collaborative decision-making process, the MEL can achieve better outcomes (the usefulness of evidence needed) and build stronger network of work to induce other cycle of action-research.

In terms of the organization dimension, we need to provide ongoing training to MEL users on the various tools designed and emphasize their needs. It is important to integrate their contributions, especially with

regard to the collaborative structure that is coming together around the MEL (as well as the living labs). This phase is crucial to ensure that the methods and tools become institutionalized within the project in various living labs and subsequently re-appropriated by the living labs stakeholders, particularly in their capacity to be tacit. This will enable the automatic collection of necessary data and shared analysis among stakeholders, leading to an optimal research action cycle. However, it is important to be practical and understand that this process depends on other aspects of living labs, such as the dynamics of the infrastructures around the living labs, their institutional environments, or more explicitly, the context.

Concluding remarks

As the Health & Territories project is showing, the implementation of monitoring and evaluation in living labs lacks a predefined pattern, especially in terms of *ex-ante*, *in-itinere*, or *ex-post* framing. Furthermore, it is essential still difficult to apprehend the conception and the results of monitoring, evaluation, and learning in this project, especially considering that living labs are being set up at different levels and in various contexts. The complexity of such task is further compounded by the involvement of multiple stakeholders, constantly shifting objectives, and ongoing negotiation between living lab participants, researchers, and partners. To overcome these challenges, it is crucial to establish a flexible and adaptive framework for monitoring and evaluation. The following discussion is based on the lessons learned so far that help make sense of the ongoing monitoring and evaluation planification process.

First, we need to understand the genesis of such a project. This project, which proposes to build living labs in an anarchic fashion⁴, inherently freed itself from the principles of constructing a strict MEL plan. The first step was to break away from the logic of the logical framework, which imposes a list of indicators and variables to be measured, according to programmatic objectives and sub-objectives. This is inherently inconsistent with the very essence of a project that aims to set up living labs, and in particular to set up living labs for the transition of agroecosystems (see McPhee et al., 2021). Thus, the coordination of the project has not chosen to follow a particular logical framework, a series of predefined indicators, in order to measure at different time steps the different variables that account for the good or bad progress of the project. The implementation of living labs, within the principles a participatory action research epistemology, is a dynamic, non-linear situation, with shifting objectives and a set-up that requires rapid adaptation to a changing context.

Thus, the decision to adapt to different key moments in the living labs led to the development of a MEL plan. This plan included the creation of specific tools to collect data and information, depending on the critical moments of the living labs: an observation protocol for the collective highlights, a series of interviews to understand the process of living labs emergence, and a protocol for co-designing the MEL of experiments and interventions. As these tools are developed alongside the living labs burgeoning, it became clear that a framework was needed to guide the logic of MEL. Such framework should support the decisions that have to be taken in the living labs, notably considering the participatory action research principles induced by the project's approach which consequently engages the appropriation of MEL by the living labs' stakeholders.

The mentoring provided through the LIFT project allowed the Santé & Territoires project team to reframe their MEL step by step. It seems that the UFE framework was the most appropriate for the project, as it could help define evaluation objectives more closely with MEL users, receive direct feedback, and make decisions on various aspects of the living labs (J. A. A. Gamble, 2008; Patton, 2008). For instance, this can include organizing efficient communication to ensure constant stakeholder involvement, selecting the level of participation at different stages of the project, and organizing the co-design of agroecosystems innovations, among other needs. Such MEL framework will be also useful in defining the roles of users in the evaluation process, such as who designs the evaluation, who has use for it, and what use it serves. At this stage, the coordination team is trying to get the various teams to take ownership of the MEL and set up evaluation plans for coherent needs (see Ramírez & Brodhead, 2013). LIFT also guides us on the need for a rigorous evaluation plan that is adaptable to uncertainty, complex and wicked problems, and emergent institutionalization. In other words, the focus should be on supporting and accompanying change, rather than judging the effectiveness and efficiency of the project (J. Gamble et al., 2021). These are the guiding principles of developmental evaluation (UFDE). It is now

⁴ Not to be understood here in the sense of political philosophy, but in the sense of a *construction without dominant founding principles*, another meaning of the suffix *-archia*.

up to the project to make sense of these types of evaluation by helping stakeholders to appropriate these frameworks, the design of the evaluation, and the usefulness of the evaluations carried out within the project.

Today, in the course of the project, it is therefore essential to carry out these different stages linked to the UFDE. It intends to emancipate living lab stakeholders from the object of science, from the interventions conceived in living labs, and from their monitoring and evaluation. However, this task is limited by the spatial, temporal, and material boundaries of the project-based society, which are inherent principles to the conduct of R&D project (see Barrier, 2011, 2014). To put it simply, while an innovative evaluation plan might have a unique approach, the question of how it can be executed within the framework of a project remains a challenge. This is particularly true when setting up systems based on emancipation, such as Participatory Action Research (PAR), within a limited resource environment. In addition, these constraints should be considered in a broader evaluation of the approach to establishing living labs and their evaluation methods.

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