



Report on the First International Forum on Agroecosystem Living Labs (IF-ALL)

October 4 to 6, 2023 | Palais des congrès | Montréal, QC, Canada



Ann Lévesque, Chris McPhee, François Chrétien, Javier Gracia-Garza, René Morissette, Christian Huyghe
& Muriel Mambrini

2024

"We would like to acknowledge that the land on which we gather during the IF-ALL is part of an ancestral territory that is historically known as a place of meeting and exchange amongst many First Nations, including the Kanien'kehá:ka (Mohawk) Nation."

To cite this report: Lévesque, A., McPhee, C., Chrétien, F., Gracia-Garza, J., Morissette, R., Huyghe, C. & Mambrini, M. (2024). Report on the First Forum on Agroecosystem Living Labs (IF-ALL). Adaptation Futures 2023. Available online: <https://il-lv.agr.gc.ca/ncloud/index.php/s/EPPJWxAteLs4Be>

Contents

- Executive summary4
- Introduction.....6
- What is a living lab?.....8
- What is an agroecosystem living lab?9
- Invited speaker presentations..... 10
- Why choose the LL approach?..... 10
- What are the main challenges of LL projects? 11
- Theme 1: “Promoting innovation through living labs” 14
- Theme 2: “Fostering transitions toward sustainable food systems through living labs” 18
- Theme 3: “Empowering participation, strengthening participatory governance in living labs” 22
- Theme 4: “Evaluating success in living labs” 26
- Networking event summary 29
- Field visit summary 29
- Reflection on the future 31
- Closing remarks 33
- Appendix 1: Oral presentations..... 34
- Appendix 2: Posters summary 36
- Appendix 3: About the organizers..... 39
- Appendix 4: List of organizations that participated in IF-ALL..... 40

Executive summary

The first International Forum on Agroecosystem Living Labs (IF-ALL), held in Montreal, Canada, from October 4-6, 2023, underscored the increasingly crucial role agroecosystem living labs (LL) are playing in fostering innovation in the agriculture and agri-food sector. These LLs serve as collaborative platforms that bring together diverse stakeholders, including farmers, scientists, and partners, to collectively create, test, and evaluate innovative solutions for addressing challenges in agroecosystems.

Co-hosted by Agriculture and Agri-Food Canada (AAFC) and France's National Institute for Agriculture, Food, and the Environment (INRAE), IF-ALL provided a global stage for experts, practitioners, and researchers to discuss the pivotal role of agroecosystem LLs. This event brought together more than 250 attendees from 17 countries to listen to and engage in dialogue with six invited speakers and 20 scientific communication presenters and explore 18 virtual posters related to agroecosystem LLs. IF-ALL revolved around four core themes: promoting innovation, fostering transitions, empowering participation, and evaluating success. These themes complement each other and collectively support the development of sustainable agroecosystems through collaborative and community-driven processes.

The "promoting innovation" theme addressed diverse challenges in LL projects, with a particular emphasis on the critical issue of sustained funding, advocating for financial models that extend beyond traditional cycles. Participants highlight the dynamic process of building trust and relationships within LLs, emphasizing collaboration and active participation from farmers who contribute invaluable knowledge. It accentuates the importance of inclusivity and collaboration, and the need to endorse diverse knowledge systems, including Indigenous perspectives. The theme underscores the central role of fluid knowledge circulation in innovation for knowledge dissemination at a larger scale. The theme also advocates for enhancing knowledge by integrating social scientists and managing the expectations of farmers and researchers, necessitating a shift in mindset and a comprehensive LL approach.

The "fostering transition" theme underscored the intricate nature of the food system and emphasizes the possibility of understanding the entire value chain for effective interventions during its transition. Active farmer participation in LLs, focusing on problem sharing, peer-to-peer learning, and understanding individual contexts are pivotal for sustainable practices. Trust and governance models are fundamental for LL success, requiring time and positive relationships. Managing expectations, knowledge exchange, and long-term policy support are key elements, while scalability depends on effective knowledge transfer and complementary policies.

The "empowering participation" theme emphasized the importance of community building by leveraging existing relationships and establishing trust. Empowerment is achieved through practices such as reflexivity, community ownership, and co-creation, which create spaces for democratic dialogue and diverse perspectives. The LL approach serves as a catalyst for innovation, fostering social learning toward sustainability. A conceptual framework is deemed essential, emphasizing the co-production of actionable knowledge and LL participants engagement in reflective research. Time and evaluation play crucial roles in observing community shifts, assessing changes, and learning from both successes and failures on a landscape-wide scale. A LL engages diverse stakeholders, including farmers and partners, in collaborative vision creation. Co-creation and training underscore the importance of facilitators with specialized knowledge and training for understanding and meeting the needs of LL participants.

In the "evaluating success" theme, participants explored the need for diverse methods for measuring success, incorporating qualitative approaches such as storytelling and quantitative methods such as surveys. The discussion delved into psychological and sociological dimensions, revealing how societal interactions shape

attitudes and actions, with a focus on the complexities of assessing intangible factors such as social values and beliefs. Participants emphasized the importance of documenting experiences and lessons learned to enhance the LL approach, recognizing the value of incorporating farmers' needs into the evaluation as a social learning tool. Additionally, they stressed the inadequacy of traditional short-term funding cycles for LL initiatives, advocating for long-term financing to effectively showcase impact.

Overall, several key messages emerged from the forum: the need for innovation to tackle complex issues, the significance of building trust and maintaining relationships within and beyond LLs, the involvement of various stakeholders, the tension between real-time on-farm decisions and long-term research, knowledge exchange through documenting lessons learned, the pivotal role of peer-to-peer learning among farmers, and the importance of investing in research and capacity development to scale-up innovations and research findings. These topics represent the challenges faced by the agroecosystem LL approach, which include managing the complexity of transdisciplinary, multi-stakeholder collaborations, balancing different interests, and adapting research and innovation methods to effectively address pressing issues related to common goods and sustainability. In addition, effective communication among participants and between LL projects emerged as a crucial factor for success, regardless of the specific parameters used to measure success. Addressing these challenges involves strong leadership, effective project management, collaboration, and continuous adaptation based on input from users, researchers, and partners.

The broader need emerging from IF-ALL is the establishment of a global community of practice rooted in agroecosystem LLs. The goal of this community of practice is to work together to share learning and experiences that will increase the robustness of the LL approach, allowing countries worldwide to adopt and adapt it effectively in addressing grand challenges within agroecosystems. This community of practice could encourage collaboration across different agroecosystem LLs worldwide, focusing on consolidating scientific knowledge and driving innovation. Realizing this vision will require transdisciplinary collaboration, theoretical and empirical research, and fostering knowledge exchange through presentations, workshops, and future forums to foster continuous dialogue and promote innovation in agroecosystems worldwide. In the same vein, the second edition of the IF-ALL will take place in France in autumn 2025.

IF-ALL 2023 in Numbers

- ❖ 4 keynote speakers
- ❖ 8 invited speakers
- ❖ 20 oral presentations
- ❖ 18 virtual posters
- ❖ 1 networking event
- ❖ 1 field visit
- ❖ 6 conference articles
- ❖ More than 250 attendees
 - Coming from 17 countries representing 35 organizations

Introduction

In 2018, Canada proposed the idea of agroecosystem LLs to the G20 Ministers of Agriculture, leading to the creation of an international agroecosystem LL working group. This group, co-chaired by Canada and the United States, included representatives from 10 countries and the European Commission. Since the publication of the working group's executive report¹ in 2019, there has been increasing interest in the agroecosystem LL approach to develop innovative solutions to tackle agriculture and agri-food challenges, promote transdisciplinary research, increase and secure funding, improve partners involvement, and create frameworks to accelerate the innovation and research of sustainable farming practices. Thus, the International Forum on Agroecosystem Living Labs (IF-ALL) celebrated the fifth anniversary of Canada's introduction of the agroecosystem LL concept in 2018.

Agriculture and Agri-Food Canada (AAFC) and France's National Institute for Agriculture, Food, and the Environment (INRAE) jointly organized this inaugural International Forum, which was embedded within the Adaptation Futures Conference from October 2–6, 2023, in Montreal, Canada. The event included discussion panels, sessions for scientific papers, networking opportunities, a field visit, and had the overarching goal of sharing best practices, exchanging knowledge from case studies, and tackling the obstacles encountered by the worldwide agroecosystem LL community.

A diverse line-up of 43 LL specialists, such as academics, governmental researchers, policy makers, practitioners, and Indigenous representatives, presented case studies, scientific papers, and posters on the following themes:

1. **Promoting innovation through living labs:** finding innovative ways to establish productive agroecosystems, capturing the experience of scientists working using an open innovation approach, capitalizing on the potential of local knowledge, promoting the dialogue between scientific and empirical knowledge, and exploring with policy makers new ways to enable open innovation systems
2. **Fostering transitions toward sustainable food systems through living labs:** for food production, transformation, and consumption
3. **Empowering participation, strengthening participatory governance in living labs:** encouraging inclusion of all relevant partners and identifying best practices to work on shared goals with a prospective vision
4. **Evaluating success in living labs:** natural and social indicators to measure success of living labs, including processes, innovation outcomes, and impacts beyond the living labs

These themes collectively work together to harness the potential of LLs in agroecosystems to drive meaningful change, from practical solutions to sustainable practices and governance improvements.

The event started with a plenary session led by the IF-ALL co-chairs, François Chrétien (Director of Research Development and Technology at AAFC) and Christian Huyghe (Scientific Director of Agriculture at INRAE). These two organizations have a long-standing collaboration, not only in developing the concept of agroecosystem LLs but also in planning this event. Mr. Chrétien conveyed his gratitude for the chance to come together and engage in meaningful discussions, which was focused on setting forth the best practices in the field of agroecosystem LLs and sharing valuable insights derived from case studies across the globe. He also viewed IF-ALL as a pivotal milestone in the global expansion of agroecosystem LLs to address various grand challenges, such as climate change and loss of biodiversity.

Mr. Huyghe elaborated on three significant gamechangers currently underway, where agroecosystem LLs can play a crucial role in his organization. First, INRAE are redefining agroecology as a new paradigm, emphasizing a shift in perspective towards diversity and recognizing biological regulation as a source of ecosystem services. Second, INRAE underscored that LLs represent a revolutionary approach to understanding how people collaborate, co-

design the future, and implement changes on the ground. This approach concurrently addresses objectives and transition pathways, offering a novel and advantageous perspective. The third major change is the substantial financial investment in LLs in Canada, Europe, and other countries around the globe, reflecting a belief that the LL approach holds the key to the future.

Subsequently, The Honorable Lawrence MacAulay, Canadian Minister of Agriculture and Agri-Food, delivered remarks. He discussed how, in 2018, they introduced the idea at the G20 meeting in Argentina, and he highlighted the continuous progress made by AAFC since then. Since 2018, AAFC has maintained its commitment to collaborative efforts with international partners, and IF-ALL represents an opportunity to share the accomplishments and insights of agroecosystem LLs with the global community.

“At AAFC, we wanted to start from the ground up, right on the farm. We wanted farmers, scientists, and other partners to be able to work together, side by side. Because farmers understand the reality of farming and by working together, we are finding novel solutions to help farmers battle climate change and other challenges they face. All of this takes a team approach. Our goal is a sustainable agriculture sector that can feed the world of today and tomorrow. And that’s what our living labs are all about.”

-Lawrence MacAulay, Minister of AAFC



¹ International Agroecosystem Living Laboratories Working Group. (2019). Agroecosystem Living Laboratories: Executive Report. G20 Meeting of Agricultural Chief Scientists (G20-MACS). Available online: https://www.macsg20.org/fileadmin/macsg20/Annual_Meetings/2019_Japan/ALL_Executive_Report.pdf (accessed on February 5, 2024).

Following this, opening remarks were delivered by Philippe Mauguin, CEO of INRAE, and Gilles Saindon, Assistant Deputy Minister of AAFC. Both expressed great enthusiasm for the event. These two quotations underscored the significance of LL for their respective organizations and their strong commitment to actively participate in the global agroecosystem LLs community:

"Together, this is a chance to highlight the great collaboration we have enjoyed between AAFC and INRAE, for a long time, but especially these past 5 years on the topic of agroecosystem living labs. We participate together on European projects but also meet on a regular basis to share our experiences and move forward together, building connections across our networks of living labs. Our living labs are a notable example of the type of mission-driven science we are focusing on at AAFC. We are looking forward to sharing with you what we have learned, and learning from you about your experiences."

-Gilles Saindon (Assistant Deputy Minister, Science and Technology Branch, AAFC)

"The Agroecosystem living lab is an approach that we co-construct with you [AAFC], and which we have taken forward with Gilles Saindon, at the G20 meeting, and which has gained attention at the international level. Agroecosystem living labs have become an important approach for INRAE, which is highly committed to the high impact of its research work, and deeply involved in participatory approaches, open science and transformation studies. In fact, thanks to you [AAFC] and with you, we have been able to come up with this research initiative that INRAE wished and will continue to collaborate. And this is also why we have been working together with AAFC in preparation for the first International Forum on Agroecosystem Living Labs."

-Philippe Mauguin (CEO, INRAE)

After the introductory remarks, Javier Gracia-Garza (AAFC-retired), the chair of the IF-ALL scientific committee, provided an in-depth discussion on the evolution of the agroecosystem LL concept.

What is a living lab?

In the face of grand challenges, the LL approach is gaining increasing attention in various sectors worldwide. LLs represent an innovative approach that fosters collaboration between users, scientists, and partners. In LLs, diverse participants work together to create and refine innovations tailored to user needs and challenges. In an agroecosystem context, LLs bring together farmers, scientists, and other partners to co-create, test, and evaluate innovative practices and technologies to address the agri-environmental challenges. Additionally, LLs provide a platform for evaluating successes, enabling ongoing improvement, iterative reflection, and social learning.

Living labs' three core principles:

1. **User-centered innovation** ensures that users' needs and requirements are central to the innovation process and that users are actively involved throughout it.
2. **Multi-stakeholder participation** means that LLs involve a range of actors, such as farmers, researchers, industry organizations, policymakers, and consumers.
3. **Testing in the real-life context of use** stresses that users in LLs test the innovations in their own real-life settings.

What is an agroecosystem living lab?

Since 2018, the LL approach has gained popularity in addressing pressing issues such as climate change and other environmental concerns in agriculture and agri-food systems. The G20 international working group on agroecosystem LLs (G20-MACS)² provided a definition and mapping of activities across member countries. At that time, numerous countries, including Canada, the United States, France, Germany, and Argentina, had adopted some elements of the LLs approach to more effectively tackle contemporary challenges within agroecosystems, but comprehensive examples had not yet been implemented.

Subsequent refinement of the defining characteristics of agroecosystem LLs came through collaboration between Canada and France, involving the sharing of best practices, knowledge exchange, and a harmonized understanding of agroecosystem LLs across different nations. Agroecosystem LLs are primarily geared toward fostering innovation manifesting through beneficial management practices, technological advancements, or agri-food processes improvements. As described in a paper jointly authored by AAFC and INRAE (McPhee et al., 2021)³, agroecosystem LLs share the general features common to all living labs (i.e., user-centered innovation, multi-stakeholder participation and testing in the real-life context of use) in addition to specific characteristics that are unique to agroecosystem LLs:

- Agroecosystem LLs actively engage in knowledge production and knowledge network creation while exhibiting an exceptionally high level of evaluation and data management.
- Agroecosystem LLs operate on long, seasonal innovation cycles marked by significant uncertainty due to external factors.
- The scope of their impact extends to scaling up and out, targeting outcomes that affect the broader domain of agriculture and agri-food systems.
- Participants in these agroecosystem LLs typically include public sector researchers, and the roles of users may be varied and can adapt over time.
- Often driven by the public sector or academic institutions, agroecosystem LLs typically involve a multitude of partners, interests and values, requiring intricate governance schemes.
- Furthermore, agroecosystem LLs are embedded within and examined at the scale of agroecosystems, emphasizing their connection to the broader ecological context and their pivotal role in fostering sustainability and resilience.

“An agroecosystem living lab is not a research project; it is an innovation project supported by research.”

- Chris McPhee, AAFC

² International Agroecosystem Living Laboratories Working Group. (2019). Agroecosystem Living Laboratories: Executive Report. G20 Meeting of Agricultural Chief Scientists (G20-MACS). Available online: https://www.macsg20.org/fileadmin/macsg/Annual_Meetings/2019_Japan/ALL_Executive_Report.pdf (accessed on February 5, 2024).

³ McPhee, C., Banczerz, M., Mambri-Doudet, M., Chrétien, F., Huyghe, C., & Gracia-Garza, J. (2021). The defining characteristics of agroecosystem living labs. *Sustainability*, 13(4), 1718.

Invited speaker presentations

The IF-ALL Scientific Committee welcomed 8 invited presenters to highlight examples of large international programs, projects, or initiatives relevant to the agroecosystem LL approach. The aim of these presentations was to provide a space for the invited speaker to explain why they chose the agroecosystem living lab approach and to share their experiences, learnings, and challenges from its implementation.

Organizations represented by invited speaker presentations:

- Agriculture and Agri-Food Canada (AAFC)
- Living Lab – Bridge to Land Water Sky, the first Indigenous-led living lab from AAFC’s network of LLs
- France's National Institute for Agriculture, Food, and the Environment (INRAE)
- United States Department of Agriculture (USDA) Long-Term Agroecosystem Research (LTAR) Network
- European Commission’s Directorate-General on Agriculture and Rural Development (DG AGRI)
- ALL-Ready European Commission Horizon 2020 Project
- North America Network for Integrated Resilience Agricultural Research (NIARR)
- Argentina’s Instituto Nacional de Tecnología Agropecuaria (INTA)

Each of the speakers acknowledged the LL approach as a promising means of fostering collaboration among various stakeholders, facilitating the co-design of solutions, and proactively engaging with complex territorial issues. This collaborative process significantly enriches their strategies and serves as a catalyst for innovation within their respective projects.

Why choose the LL approach?

The invited speakers highlighted that organizations choose the LL approach for different reasons. AAFC recognized an urgent need to accelerate their response to climate change and other agro-environmental issues. This recognition led to the development of a nationwide network of LLs. The aim of this network is to accelerate the innovation and adoption of agricultural beneficial management practices across Canada. The program brings together farmers, scientists, and other collaborators to co-develop, test, and evaluate practices and technologies that increase carbon sequestration and reduce greenhouse gas emissions, while also providing environmental co-benefits.

For the European Commission, the LL approach aligns with their goal of promoting sustainable farming practices across Europe. They see LLs as open innovation ecosystems that involve farmers and foresters at the center of research activities. Europe's diverse agricultural and environmental conditions require context-specific solutions, and LLs allow for co-creation, rapid prototyping, and testing of these solutions in specific territories. The multi-actor approach in LLs fits well with the European Commission's vision of involving all relevant actors in the agri-food chain and promoting a systems approach to address agricultural production challenges.

In the case of ALL-Ready, this Horizon 2020 coordination and support action was asked by the European Commission to lay a foundation for a future network of agroecology living labs and research infrastructures. Specifically, in this context, the LL approach was selected by the European Commission as a means to enable the transition towards agroecology throughout Europe. This decision was grounded on the belief that agroecology has the potential to enhance the sustainability and resilience of farming systems amidst various pressing challenges confronting Europe, such as climate change, biodiversity decline, resource scarcity, and soil and water quality deterioration. Ending in October 2023, this project involved a consortium of partners from across Europe

(plus AAFC as an international partner) with multiple deliverables and recommendations provided to the European Commission to enable the implementation of the full partnership and network of agroecology living labs and research infrastructures.

NIARR is a collaboration that brings together several research networks focused on resilience in agricultural systems across North America. The choice of conducting long-time on-farm research is driven by the need to address resilience and vulnerability to regime shifts in agricultural landscapes at various spatial and temporal scales. By emphasizing collaboration, the initiative can tap into the strengths of each research network and bring together expertise and knowledge in a shared space.

For INRAE, the LL approach aligns with its strategy for research, partnership for innovation, and support to public policies. They recognize that their research institute is quite large, with diverse scientific and policy priorities. By embracing the LL approach, they can better address the tension between private goods (such as production and business) and common goods (biodiversity, air, water, health) while considering the trade-offs between present and future needs. It allows them to create relevant solutions for everyone and engage in co-design and participatory approaches, reflecting the changing dynamics between science, society, and policymakers.

In the case of INTA in Argentina, they have implemented territorial innovation platforms as a form of LLs. These platforms serve as social-technical spaces where various stakeholders, including municipalities, governments, associations, and more, work together to identify and prioritize best management practices. This approach helps address complex issues in the territories while involving a wide range of participants. It also encourages the convergence of research and extension agendas, strengthening the implementation of a territorial approach. However, challenges persist in governance, overlapping structures, and skills development, emphasizing the need for improved management and coordination.

For the USDA, the Long-term Agroecosystem Research (LTAR) Network offers a valuable framework for conducting long-term, coordinated research in collaboration with a wide range of stakeholders, including farmers, scientists, and government agencies. This approach allows for the integration of diverse perspectives, data, and experiences to address the complex challenges in agriculture, particularly in the context of climate change and adaptation. LTAR also facilitates the translation of scientific research into practical tools and information that can directly benefit farmers and the broader agricultural community.

Living Lab – Bridge to Land Water Sky is part of AAFC's network of LLs and therefore shares overall objectives in the application of the LL approach in addition to a local need to address challenges and opportunities related to land and resource management, cultural revitalization, and community empowerment. Led by Mistawasis Nêhiyawak in Saskatchewan, Canada, this LL aligns with the community's deep connection to their land and culture, as it empowers them to take a collaborative and community-driven stance in finding sustainable solutions. The project responds to climate change, drought, and the exploration of alternative and resilient land uses while reviving Indigenous cultural practices and values.

What are the main challenges of LL projects?

While the eight speakers each face distinct challenges, there are common threads that unite them in their efforts to increase the effectiveness of their initiatives.

Fostering transdisciplinary research and partners collaboration

In the pursuit of addressing agri-environmental issues, LLs must navigate the intricate landscape of transdisciplinary research, merging scientific knowledge coming from various disciplines (such as agricultural,

natural, economic and social sciences) with local knowledge to comprehend agroecosystem challenges and the needs of various partners across different scales. This task necessitates effective coordination, data harmonization, and the expansion of research efforts, all of which pose substantial logistical hurdles. These projects generate substantial amounts of data that must be well organized, accessible, and usable for multiple stakeholders. Managing such a diverse network of stakeholders requires the establishment of efficient communication channels and regular meetings, underscoring the importance of robust management skills. Effective exchange, capacity building, training, role definitions, and experience sharing are essential but resource-intensive tasks to secure informed and active stakeholder involvement.

Engaging active partner collaboration

Partner engagement and knowledge exchange constitute vital components of LLs. LLs must navigate the interests of various partners while pursuing scientific objectives. This involves the complex task of reconciling the interests of various partners with the broader objectives of conserving common goods such as biodiversity and environmental health. Achieving this equilibrium is an ongoing challenge. The transdisciplinary character of a LL poses numerous challenges, including the need for collaborative design and participatory approaches, adjusting research methods to fit the innovation cycle, redefining the roles of researchers, partnering with local entities, tackling regional variations, aligning with policy goals, and maintaining independence in research and innovation endeavours.

Changing mindsets

The presenters stressed the significance of changing participants' perspectives, establishing practical expectations, and adopting a comprehensive approach that considers the entire agroecosystem context in a LL project. This is especially the case in the Living Lab – Bridge to Land Water Sky, which requires a fundamental shift in mindset and decision-making processes, moving away from the traditional top-down approach to one that empowers the community to lead in land and resource management. This is particularly relevant for Indigenous communities, such as Mistawasis Nêhiyawak, where environmental health is central to decision-making processes in land management.

Considering long-term implications and managing trade-offs

LLs must consider long-term implications in a field often dominated by short-term priorities. They frequently confront intricate issues that require trade-offs between immediate gains and the well-being of ecosystems and communities. Striking a balance between present and future needs necessitates meticulous decision making and can be a substantial challenge. Additionally, innovation processes take time, and LLs must cope with the long innovation cycles inherent to agriculture due to its seasonal nature, resulting in the slower adoption of sustainable practices compared to high-tech sectors. Scientists involved in these projects must adapt to the dynamic and iterative nature of LLs, which can be challenging for those more accustomed to traditional research approaches. Balancing the urgency of addressing environmental issues with the time-consuming process of co-creating solutions presents a tension that must be managed effectively. In addition, natural processes, such as soil organic matter fluctuations, take decades, if not centuries, to establish new equilibriums. The dual challenge involves the prolonged impact of agricultural practices on these natural processes and the co-creation dynamic.

Navigating policy and knowledge exchange

There are elevated expectations from governments and policymakers concerning the outcomes and impact of LLs, which can create pressure and challenges in terms of research design evaluation and reporting. Furthermore, they need to address the challenge of knowledge exchange by translating complex scientific research into practical tools and information that can be readily understood and utilized by stakeholders. Moreover, translating research findings to different regions and ecosystems can be challenging, as solutions in one agroecosystem LL may not directly apply to others.

Sustaining ongoing support and long-term funding

Ensuring the continued success of LL initiatives requires long-term funding, ongoing support, and efforts to expand geographical coverage. This involves engaging policymakers, aligning political priorities with sustainability goals, securing the necessary resources for agroecosystem LL projects and scaling up innovations.

It is important to note that, while these are shared challenges associated with the LLs approach in agriculture, each initiative may face unique, context-specific challenges that require tailored solutions and strategies to overcome.





Theme 1: “Promoting innovation through living labs”

Overview of presentations

In this session, the focus was on fostering innovation in agroecosystems. François Chrétien (AAFC) led this thematic session. Overall, these presentations collectively underscored the importance of collaboration, adaptation, and knowledge exchange in driving innovation in agroecosystems. Participants stressed the importance of building relationships and taking time to foster trust among partners. They also recognized the importance of managing needs and expectations between producers, who need to make real-time decisions based on their farm priorities, and researchers, who require long-term data for their work.

The issue of whether innovation is scalable to larger contexts was discussed, noting challenges in spreading knowledge and the need for supportive policies. The importance of documenting lessons learned was highlighted, along with the crucial roles of extension agents and peer-to-peer learning to scale-up sustainable practices.



Discussion session

The discussion began with the importance of empowering participation and evaluation within the context of innovation within LLs. The moderator, Chris McPhee (AAFC), noted that, although these presentations aimed to focus on innovation, the presenters touched on various interconnected IF-ALL themes, emphasizing the uniqueness and place-based context of these LLs.

Defining innovation

The conversation began with a focus on defining innovation. Participants emphasized the need to clarify what innovation means within the context of LLs. Innovation is change, and may encompass innovation in farming practices, technological innovation or process innovation. Understanding the specific type of innovation targeted by a LL is crucial for setting clear goals and expectations. In a LL, participants are creating and testing innovations

in a collaborative way. Adoption is a downstream activity that happens after the innovation work is done, and its primarily other farmers doing the adoption at that point, although farmers may also choose to adopt what they worked on through the innovation cycle.

Sustained funding and motivation

Given the iterative nature of LLs, it was acknowledged that traditional research funding cycles (less than 5 years) may not be sufficient for LL projects; longer-term commitments might be imperative. The discussion delved into the challenge of ensuring the sustainability of LLs once initial project funding is exhausted. This raised pertinent questions regarding how to secure continued support for these initiatives and the need to adapt funding models to adequately sustain LLs. Furthermore, sustaining the motivation of all partners, encompassing farmers, researchers, and other relevant partners involved, over an extended period, is vital for maintaining the ongoing success of LLs.

Building trust and relationships

The discussion focused on the significance of building relationships and the recurring theme of trust within the LL approach. Participants highlighted the essential role of time in building trust and relationships. Building trust in environments marked by polarization is recognized as a formidable challenge and acknowledging the potential for failure and being prepared to implement necessary changes in governance, resource allocation, and LL partners participation were underscored as critical factors for success.

Inclusivity and collaboration

In the pursuit of fostering innovation within LLs, participants highlighted the importance of involving individuals with diverse knowledge backgrounds, such as incorporating Indigenous-led research and perspectives, or integrating a value-chain approach into LL projects. Additionally, they stressed the value of dedicating time to identifying key stakeholders and determining the most suitable engagement scale, whether at the local, regional, or national level.

Providing fluid circulation of knowledge

Central to innovation is the fluid exchange of knowledge and information among LL partners. Ensuring that knowledge flows effectively within and beyond LLs is essential. This includes knowledge exchange among researchers, farmers, and other partners. The challenge is to create a dynamic system where information is shared in a timely and effective manner, fostering continuous learning and improvement. In addition, knowledge transfer is not just about transferring knowledge but ensuring that this transfer remains resilient even as participants change or as resources fluctuate. Participants emphasized the importance of training extension agents, agriculture representatives, farmers, and other professionals in this collaborative approach. The concept of a network of LL projects, as opposed to isolated projects within specific agroecosystems, is a crucial factor in enhancing the fluidity of knowledge exchange among LLs on a regional, country, continental, or international scale.

Reducing timeframes and avoiding repetition

Many LL projects have specific timelines, and participants expressed concerns about the limited time available to achieve meaningful outcomes. Finding ways to expedite the development and impact of LLs is important, especially for projects with short durations. Strategies for efficiency and acceleration need to be explored. A common challenge mentioned was the repetition of projects. Instead of rehashing the same research and initiatives, it is essential to build on previous knowledge and experiences. Avoiding duplication and leveraging existing resources and knowledge can lead to more efficient and effective outcomes. This highlights the crucial role of open-data approaches in addressing common goods. Managing data becomes challenging when using intellectual property approaches that restrict the extent to which sharing is possible.

Embracing co-creation processes

LLs generate models, data, and collaborative approaches that raise awareness and support collective knowledge production. This enables a better understanding of the needs and expectations of producers and other partners involved in the co-creation process. Co-creation processes were highlighted as a crucial aspect, stressing the importance of involving actors with diverse knowledge backgrounds. Facilitators were recognized for their pivotal role throughout the LL processes, emphasizing the need for strong facilitation skills.

Enhancing knowledge exchange across diverse research domains

Other research domains and practical approaches relevant to the LL approach include participatory action research, co-innovation, and communities of practice, and strategies are needed for their seamless integration within a LL network. Additionally, there is an emphasis on discerning the distinctions between transdisciplinary work and LLs, fostering the exchange of valuable insights and principles between different forms of knowledge. Furthermore, the incorporation of social scientists into LLs is seen to gain a real-time understanding of the complex interplay of relationships, power dynamics, motivations, and driving forces within LLs.

Managing farmer and researcher needs and expectations

Expressing the needs and expectations of producers and researchers in the context of agroecosystem LLs is essential to foster innovation. Producers often require quick and adaptive decision making to respond to immediate challenges, while researchers seek long-term continuity of data to achieve replicable and documented outcomes in their scientific work. Farmers and scientists have different realities, with producers leaning towards practical, real-time decision-making based on their farm priorities and researchers emphasizing the collection of comprehensive data for scientific rigour.

Peer-to-peer learning and regional farm advisory systems

Peer-to-peer learning and the role of extension agents were also discussed, particularly in regions with weak extension systems. Building regionalized, permanent farm advisory systems to maintain continuity was discussed. These advisory systems should include representatives from different sectors, including farmers, researchers, and government agents. The goal is to create a knowledge transfer structure, ongoing knowledge exchange and collaboration that persists beyond individual projects. In addition, acknowledging the knowledge base of producers' adaptive management journey for agri-environmental improvement and actively involving them in the LL was emphasized as a crucial step in fostering innovation within LLs.

Changing mindset

Participants highlighted the necessity of shifting mindsets among LL partners, managing expectations, and adopting a comprehensive approach that encompasses the entire agri-food system. Furthermore, the discussion emphasized the importance of preserving the uniqueness of LLs and agroecosystems while discouraging unnecessary comparisons and uniformity.

Creating indicators of success

The participants stressed the need for establishing common criteria to measure the success of LLs. The difficulty in precisely defining what constitutes success and impact within LL initiatives was also brought to light.

Building an international community of practice

In addition, the discussion emphasized that LLs should not operate in isolation. Instead, they should foster open collaboration with the broader community. The concept of creating an international community of practice was discussed to facilitate collaboration and knowledge sharing among different LLs across regions and countries. Such a community could help in sharing best practices, lessons learned, and innovative approaches that can be adapted and implemented globally.



Theme 2: “Fostering transitions toward sustainable food systems through living labs”

Overview of presentations

In this session, the focus was promoting shifts towards sustainable food systems through LLs. Christian Huyghe (INRAE) led this thematic session. The session emphasizes the co-production of actionable and relevant solutions suited to farmers and partner's needs for achieving transition. Through the different presentations, the transition theme collectively underlines the importance of understanding the drivers, motivations, and barriers for sustainable practices in agroecosystems and the food systems. They emphasize the significance of community engagement, the role of consumers, and tailored approaches to address diverse challenges in achieving sustainability.

Additionally, the speakers in this session stressed community engagement, inclusivity, and social equity as pivotal aspects in the pursuit of sustainable solutions. To do so, LLs create a space where participants can build a mutual understanding of each other's realities and create a shared vision to foster change. Adaptation to local contexts, transdisciplinary and holistic approaches, and promoting behavioural change are recurrent themes in the pursuit of sustainability. The need for adaptive governance and supportive policies is underscored as essential components of fostering innovation and sustainability in the agriculture and food sectors.

Discussion session

Moderated by Muriel Mambrini-Doudet (IRD), this session highlighted the complexity of agricultural challenges and the importance of multi-stakeholder collaboration, adaptability to regional contexts, and taking an integrated approach to address the urgent problems and transitions. To do so, participants emphasized the need to engage various actors in the food system, including food processing and distribution partners.

The urgency of the problems in agriculture, such as climate change and sustainability, was highlighted. These grand challenges serve as significant catalysts, impacting the daily lives of individuals across various contexts. Different contexts require different approaches to sharing and spreading what happens in LLs. Understanding these variations is essential for broader applicability. However, it was noted that many agricultural systems are stuck in a "lock-in" situation, where established practices reinforce the status quo. This presents a paradox where there is a need for change, but systems resist it. The central question was how LLs can address these lock-in situations and facilitate the transition to more sustainable practices. The challenge lies in understanding how LLs can effectively drive change. The key points discussed in the session were as follows:



Complexity of the food system

Participants noted the complexity of the food system, involving multiple interconnected components. The value of considering the entire value chain and the complexity of food systems was stressed. Understanding the complexity and applying integrated approach to address lock-in situations are essential for effective interventions to foster actions toward transition of our food systems. In addition, the importance of clear definitions of sustainable food systems was emphasized.

Addressing planetary boundaries

To ensure sustainability and equilibrium, it is crucial to keep the agricultural system within planetary boundaries – meaning thresholds beyond which there is great risk of large-scale irreversible changes – such as seen with climate change, land-system change, biogeochemical flows (nitrogen and phosphorus) or freshwater use.

Diversity of stakeholders and cross-sector collaboration

To address complex food systems, there is a need to involve various actors from production to processing, marketing, distribution, and consumption. Participants stressed the value of taking a holistic approach to LLs by involving various actors in the agri-food system, not just farmers, as complexity of this system requires collaboration and learning from multiple partners. Collaboration among different sectors is vital to address challenges within food systems. Consideration should be given to the interdependencies between different components of the agri-food system. It is worth emphasizing that within LLs, there exists a dynamic interaction between power and knowledge. Participants bring their own interests, knowledge, assets, and influence into the equation. Recognizing and skillfully navigating these power dynamics is crucial, as it helps identify shared benefits and paves the way for innovation.

Involving farmers

It was mentioned that in some cases, LLs began without the active participation of farmers, leading to challenges. Farmers should be at the center of LLs, not just as passive participants – this is a requirement of the agroecosystem LL approach. However, farmers may be skeptical about certain sustainability initiatives and may not feel that they are being heard. Their input and experience are crucial in shaping effective strategies. In addition, peer-to-peer learning among farmers can help spread knowledge and innovations more effectively. Early adopters among farmers can play a vital role in promoting new practices. At the same time, it is essential to remain conscious of the barriers and levers that influence the adoption of sustainable practices on an individual level. Additionally, understanding the institutional and organizational contexts that may constrain or support these efforts at a broader scale is equally important.

Trust and governance models

The importance of governance models that foster trust and cooperation within LLs was highlighted. Effective governance is necessary to ensure the long-term success of LLs. Establishing trust also entails placing importance on the time required to nurture confidence through relationships. In addition, acknowledging uncertainties across multiple dimensions, and embracing a positive approach when collaborating with individuals within an LL's ever-evolving environment was also brought to light during this session.

Partnership integrity and intellectual property

The challenge of involving various partners coming from various sectors of the agricultural and agri-food systems in LLs while protecting their information and managing their interest in intellectual property was raised. Ethical considerations and agreements must therefore be in place at the beginning of the LL process to safeguard the interests and needs of all parties involved.

Moderating expectations

Participants emphasized the need to manage expectations when implementing LLs as there may be grand expectations from farmers regarding the outcomes of research projects and their interactions with researchers and other partners. Also, LL participants can have elevated expectations when it comes to policy and financial support. Clear and active communication is crucial in managing these expectations.

Exchanging knowledge through various channels

Some participants shared examples of LLs that focus on sharing information using testimonials and case studies featuring real experiences and feedback from farmers who have participated in LL projects. Videos, written stories, and interviews can all be part of it. Transparency and knowledge exchange are critical for engagement of LL participants. Success and efficiency in LLs should be gauged by considering all facets of knowledge exchange among diverse partners, including consumers, rather than relying exclusively on the publication of scientific papers.

Network to network

Agroecosystem LL partners are intricately linked to the agricultural and agri-food systems. Their connections extend beyond their individual LL, making them part of a wider network. This network serves multiple purposes, including the development of integrative analyses (e.g., models, mappings, data) and the co-creation of knowledge across LL communities. It also allows the LL partners to grasp the distinct strengths stemming from the extent of their connections.

Long-term support

Long-term policy support and funding are crucial for the success of LLs. It requires long-term financial backing and various other forms of assistance. It is crucial to provide LLs with the time needed to demonstrate their capabilities, particularly in a context where initiatives are frequently running for a limited duration, and then abandoned due to delayed or insufficient outcomes. Maintaining a long-term perspective is vital to the success of these LL projects.

Scalability

Questions were raised about how to effectively scale up the insights gained in LLs to have a broader impact. The challenge is to transfer the knowledge and innovations to a wider audience. In today's digital age, online tools, such as collaborative platforms, play a pivotal role in knowledge dissemination. Agricultural extension services, peer-to-peer learning and LL networks play an also vital role in knowledge dissemination. In addition, scaling up LL initiatives should involve local and national governmental institutions. Institutional stability is crucial for scaling up the impact of LLs. Another aspect of scaling up LL insights is advocating for supportive policies. This may include advocating for incentives, regulations, or subsidies that encourage sustainable farming practices.



Theme 3: “Empowering participation, strengthening participatory governance in living labs”



Overview of presentations

François Chrétien (AAFC) led this thematic session, centered on empowering participation and reinforcing participatory governance within LLs. This was achieved by promoting the inclusion of all relevant partners and identifying effective approaches to collaborate on shared objectives with a forward-looking perspective. By actively engaging societal actors throughout the co-creation process, the LL approach fosters mutual trust and co-learning. Building trust relationships and expanding networks are essential in empowering these communities.

The presentations collectively emphasize the significant role of LLs in promoting collaborative innovation and sustainability within the agricultural sector, while requiring increased community involvement and flexible governance structures.

Discussion session

Moderated by Muriel Mambrini-Doudet (IRD), the discussion delved into several critical aspects of the LL project approach to foster empowerment and participatory governance.

This session emphasizes a fundamental departure from traditional project structures, where initiatives come into a community and then depart after a set period. Instead, a LL project adopts a unique approach, seeking to integrate and collaborate with existing community structures. The focus of a LL is on building upon trust relationships and supporting LL partners in a sustainable manner.

An environment of co-creation, both physically and conceptually, is crucial for encouraging empowerment. Effective communication, the willingness to embrace discomfort and invest in time, are cited by IF-ALL participants as factors that lead to successful empowerment.

Financial considerations were discussed as well. There is a mention of the need for a flexible budget that supports the project's evolving needs. This underscores the importance of budgetary adaptability to address the challenges and opportunities that may arise. Such flexibility is crucial to reinforce the iterative nature inherent in the LL approach.

During the discussion, the participants highlighted the following key points:

Emphasizing community building

The discussion underlines the significance of building on existing communities and establishing trust relationships. Building trust among these stakeholders is crucial, which can be done by actively listening to their needs and understanding their realities.

Fostering empowerment

Empowerment within a LL can be achieved through various means. This can be facilitated by promoting reflexivity and ensuring community ownership. Establishing co-creation processes, which can not only focus on the primary goal of the co-development of innovations but can also be used to create deliberative and democratic spaces to address governance, trade-offs, and barriers. These processes also serve to connect actors and open the dialogue to voices from different perspectives, such as youth, Indigenous and environmental concerns. Additionally, identifying the knowledge holders and maintaining a living library of knowledge further contributes to empowerment within the LL. Farmer empowerment is recognized as one of the most rewarding aspects of a LL project. The conversation underscores the significance of listening to farmers' needs and ongoing communication. It highlights the importance of developing a feedback system that enables farmers to voice their concerns and provide insights for continuous improvement.

Changing mindset

The LL approach can serve as a catalyst for transformative change within its participants, leading them to evolve significantly throughout the process. When participants agree to work together, driven by a common purpose, this shared commitment not only brings about positive changes in land management but also induces internal transformations in the participants themselves.

Conceptual framework

The presentations highlighted diverse conceptual frameworks, demonstrating that LLs are versatile in addressing grand challenges, encompassing territorial development, climate change resilience enhancement, water management, and the co-development of food systems. Such conceptual frameworks, involves notably co-producing knowledge and making it more relevant, understandable, and actionable for stakeholders. The conversation underscores the importance of fertile ground, which pertains not only to the physical environment but also to how LL participants immerse themselves in co-creation processes. This includes the depth of involvement in on-farm research and their commitment to maintaining a reflective approach throughout the innovation cycle.

Time and evaluation

Time is necessary to see community shifts and changes in various indicators. The discussion suggests that evaluating these changes is essential, even when there may be resistance from some LL partners. The value of learning from both success and failure was highlighted, as was the ability to openly discuss what is going well and what is not. In addition, it is crucial to establish a reference point by documenting the enhancements made, both on a landscape scale and regarding the involvement of LL participants. It underscores the need for a patient, long-term approach to assessing the effectiveness of sustainable practices and understanding their impact on the agroecosystems.

Managing power dynamics

Empowerment also entails having the power to make a difference, but in the context of LLs, the power extends to driving changes within individuals and the entire system. It is crucial to recognize the diverse dimensions of power, including power over, power to, power with, and power within among LL participants. This comprehensive understanding of power dynamics helps participants better navigate and contribute to their LL project.

Co-creation and training

The facilitator's role is crucial within a LL context, particularly when it comes to establishing collaborative co-design spaces. This involves determining effective methods for co-designing and implementing an ongoing process of collaboration. Applying co-creation processes within an LL requires special knowledge and that the facilitator adopts a posture based on the art of dialogue. This then requires that facilitators be trained for this purpose so that they can conduct their work well and transmit the spirit of co-creation to others.

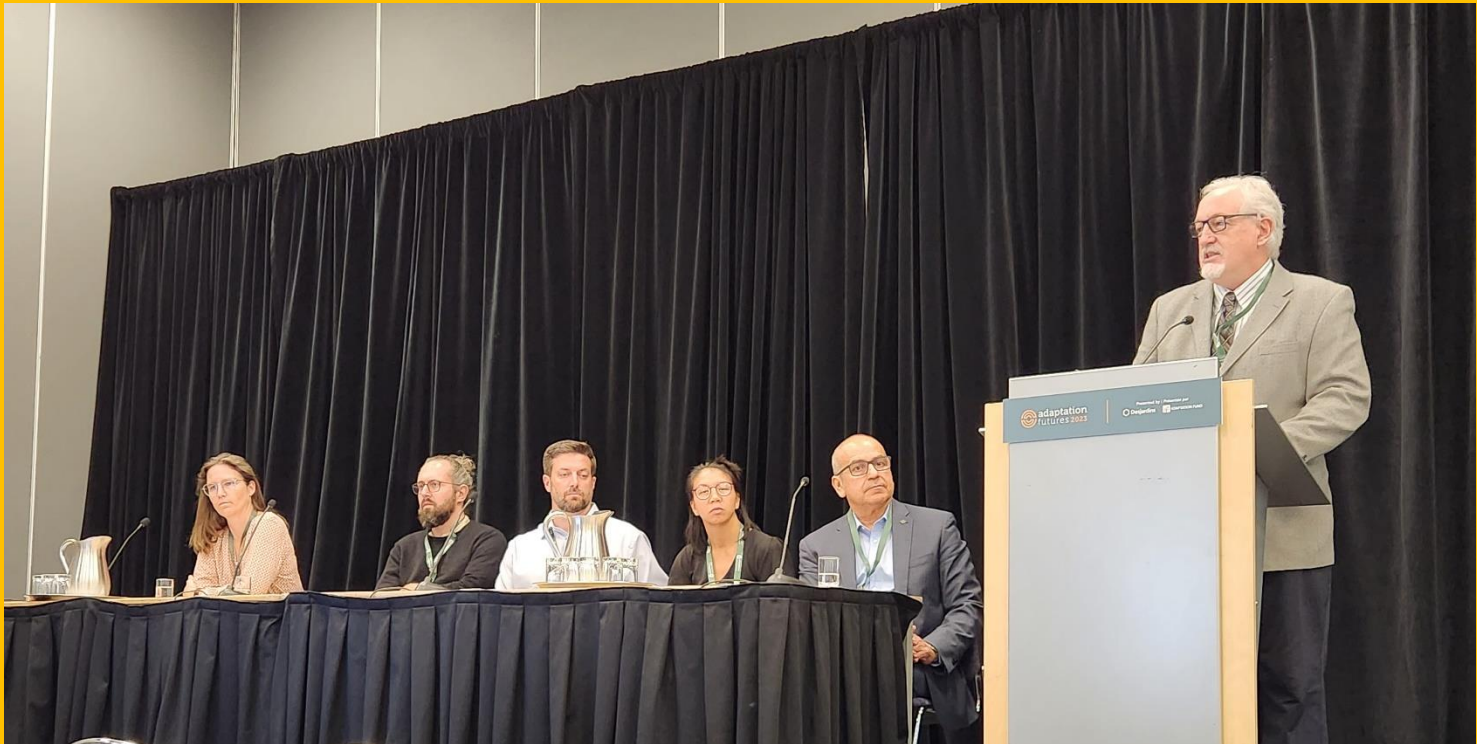
Expanding networks

LLs have facilitated the expansion of networks and collaborations. This expansion is not limited to the regions, provinces or states but extends to a larger international network.

In conclusion, participants were encouraged to utilize SLIDO for sharing their insights on the top three key factors they believe the community needs to work on to empower participation in a LL. Figure 1 visualizes the resulting words in a word cloud format.



Figure 1: The key factors that IF-ALL participants believe that the community needs to work on to empower participation in a LL.



Theme 4: “Evaluating success in living labs”

Overview of presentations

Javier Gracia-Garza (AAFC-retired) led this thematic session. The presentations concerning the assessment of LL success convey important messages. These include the necessity of interdisciplinary collaboration to comprehensively assess agroecosystem LLs. User-centered evaluations that focus on the experiences and needs of LL participants were stressed, as well as utilizing qualitative insights, satisfaction scales, and user-friendly indicators. The impact of LLs extends beyond immediate outcomes and should encompass broader societal and environmental effects. To navigate uncertainties and changing conditions, the importance of monitoring for resilience was highlighted, involving real-time data, climate triggers, and decision support tools. Customized evaluation approaches tailored to the unique context of each LL were also seen as vital, alongside a long-term perspective to measure sustainability and long-lasting impact.

Discussion session

Moderated by Chris McPhee (AAFC), the discussion was centered around the complexity of evaluating agroecosystem LLs. Their evaluation is multifaceted and goes beyond traditional indicators. It requires thinking beyond conventional quantitative indicators and incorporating qualitative assessments, including social learning, production outcomes, and value generated for the community. It also entails considering various levels of engagement and involvement among participants and assessing the long-term impacts of LLs. Below are the key points that came out from the discussion session:

Challenges of measurement

Measuring aspects such as social values, beliefs, and psychological or sociological factors can be challenging due to their abstract and non-quantifiable nature. Participants in the discussion explored various approaches to measure these aspects, which can be broadly categorized into qualitative and quantitative methods. Qualitative methods, such as storytelling, interviews, focus groups, and memory diaries, concentrate on collecting in-depth narrative data to grasp the underlying factors influencing individual behaviours. In contrast, quantitative methods involve using surveys, questionnaires, and structured scales to gather data from a larger sample, with the aim of providing numerical data that can be statistically analyzed to uncover patterns and trends.

Social values and beliefs

The participants were concerned with delving into the social values and beliefs that influence how people behave and think, especially in the context of agricultural practices and agroecosystem LLs. These social values and beliefs are the deeply embedded convictions that shape individual's decisions and actions. Recognizing and understanding these factors is vital for a thorough evaluation of success within LL projects.

Psychological and sociological aspects

The conversation also touched upon the psychological and sociological aspects that play a significant role in shaping human behaviour and perception. This involves understanding how people's minds work (psychologically) and how their interactions with society (sociologically) impact their attitudes and actions.

Meaningful change stories

Some participants highlighted the use of "meaningful change stories" to capture how people's perceptions and values evolve over time. This involves periodically asking participants about the most significant changes they have experienced and the reasons behind these changes. This can help researchers track shifts in values and beliefs.

Consumer influence

The discussion also acknowledged the role of consumers in driving changes in agricultural practices and food systems. Consumer choices and preferences can influence the behaviour of agricultural producers as they respond to market demands and consumer expectations.

The evolving field of agroecosystem LLs

Interest in agriculture-focused LLs is on the rise globally, highlighting the need to acknowledge that agroecosystem LL approach is still relatively new and evolving. Researchers and practitioners are actively exploring different approaches to better understand and measure these complex, non-tangible aspects to improve agricultural practices and systems. Participants recognized the importance of formally documenting the wealth of experience and lessons learned within the LL networks, offering a valuable opportunity for the synthesis of best practices.

Long-term funding to support LLs effectively

These initiatives require time to demonstrate their impact. The traditional funding cycle (less than 5 years) was questioned, particularly in the context of promoting long-term financing for both LLs and producers to adopt and share innovations. It was emphasized that funding mechanisms should adapt to support LLs adequately.

In addition, participants encouraged avoiding the pursuit of uniformity in evaluation approaches and sensitizing funders about the reporting process. These suggestions reflect a holistic and flexible approach to LL evaluation, acknowledging the complexity and context-specific nature of LL initiatives. Finally, participants shared their suggestions on SLIDO regarding the top three indicators the community needs to work on to measure the impact of agroecosystem LLs. Figure 2 visualizes the resulting word cloud.



Figure 2: Indicators that IF-ALL participants believe the community needs to work on to measure the impact of agroecosystem LLs



Networking event summary

Hosted by the “Omics to Close the Loop” project, the networking event highlighted several innovations in urban agriculture and the circular economy taking place in Montreal. The event included an array of engaging activities, such as presentations on the project, insights from IF-ALL delegates including AAFC, and participants exchanges aimed at kickstarting the project’s activities.

Field visit summary

The field visit, attended by 90 participants, aimed to provide insights into innovations developed throughout the Living Lab – Quebec project (2020–2023) and encourage discussions and knowledge sharing among participants. The tour included presentations and discussions at Cristallina Farm in Saint-Barthélemy, Quebec, a farm participating in the Living Lab – Quebec project. Throughout the field visit, the two projects of the Union des producteurs agricoles (UPA) (i.e.: Living Lab – Quebec and Agrisolutions Climat) were highlighted for their approaches of placing agricultural producers at the centre of efforts to improve agricultural practices for climate change adaptation and environmental sustainability. These initiatives aim to ensure the continued adoption of these practices.

The first part featured an introduction to agriculture in Quebec, an overview of UPA's role, structure, and mission, and descriptions of key UPA projects related to climate adaptation, innovation, and the environment, such as the Living Lab – Quebec, Agriclimat, and Agrisolutions Climat. The second part included a presentation by Michael Jeker, owner of Cristallina farm, about his farm, its history, and its involvement in the projects. The visit was



divided into three parts. The first part focused on carbon footprint assessment and climate adaptation, highlighting the Agriclimat project's knowledge co-construction and actions, carbon footprint assessment, adaptation to climate change, and farm action plans. A testimonial from Alphonse Pittet (Pittet farm) , who shared key findings from their carbon footprint assessment, emphasizing greenhouse gas emissions, adaptation measures and the importance of perennial systems for carbon sequestration. In the second part, the focus shifted to the host farmer's livestock management and animal heat stress management, discussing various aspects such as the number of animals, performance, genetics, and measures to manage heat stress in animals. A study conducted by Agropur on somatic cell counts during heat periods was also mentioned. The third part was dedicated to riparian zones, water quality, and biodiversity. The motivations of producers for establishing extended riparian zones were discussed, highlighting water quality improvement, biodiversity conservation, economic benefits, and social aspects. The activities of Living Lab – Quebec related to riparian zones and the results of biodiversity monitoring were presented. In addition, a presentation was given on the reintroduction of sweetgrass into agricultural landscapes. This specific work was done in partnership with the W8banaki Nation and AAFC. The last stage focused on cover crops and soil organic matter, discussing motivations for innovation, the host farmer's cover crop system, the project's contributions to the host, and activities related to cover crops and their impacts on soil organic matter.

The field visit underscored the pivotal contribution of scientists in fostering innovation at Cristallina Farm through collaborative engagement with the farmer. This served as a concrete demonstration that a LL is not a research project; it is an innovation project supported by research, where researchers, farmers, and partners actively participate to address complex challenges within agroecosystem settings.

Led by Union des producteurs agricoles (UPA), the Living Lab – Quebec project, one of the four agroecosystem LLS under AAFC's Living Laboratories Initiative, aimed to enhance agricultural practices for water quality improvement in Lac Saint-Pierre, soil health, biodiversity, and greenhouse gas reduction. It was a three-year project from 2020 to 2023, focusing on three Lac Saint-Pierre watersheds where cohabitation challenges between agriculture and ecosystems were present. The project involved more than 100 farmers, with 50 actively participating in the dairy, hog, and cash crop sectors. It encompassed co-development workshops, research activities, informal trials, and knowledge transfer events. Key projects involving farmers in the innovation and research process.

Reflection on the future

Muriel Mambrini-Doudet (IRD) and Javier Gracia-Garza (AAFC-retired), co-facilitated this closing plenary, emphasizing the main takeaways from the oral presentations, virtual posters, and group discussions. LLs are seen as robust tools for facilitating change by empowering stakeholders, co-producing knowledge, fostering collaboration and innovation. They offer practical insights into how changes can be achieved, while also emphasizing the need for a holistic view of the agricultural and agri-food system, and the inclusion of diverse perspectives to address complex challenges. They also recognized that LLs are not one-size-fits-all; their effectiveness depends on context and the specific objectives they aim to achieve. The four thematic sessions included examples from around the world that highlighted the real-world impact of LLs in addressing complex challenges.

LLs act as tool to empower people toward sustainability

LLs are seen as powerful platforms for empowerment, enabling individuals and communities to take an active role in driving positive changes and innovations while challenging conventional thinking and fostering creative solutions. LLs are recognized as key agents for empowering individuals, communities, and stakeholders to drive transitions across various domains. These transitions may encompass changes in practices, behaviours, policies, and systems. LLs empower participants by actively engaging them in co-creation, research, and innovation. This process often challenges existing mindsets and requires a willingness to change and adapt. Imagination and creativity are encouraged to reimagine the status quo for the common good.

LLs serve as collaborative platforms for knowledge production and exchange

Co-production of knowledge and a community of practice are essential components of LLs. These elements promote collaboration, learning, and the effective exchange of knowledge, contributing to the success and impact of LL initiatives. Building a community of practice is highlighted as a valuable resource for sharing knowledge, innovative ideas, lessons learned, and best practices related to agroecosystem LLs. Through these interactions, LLs facilitate knowledge creation, where diverse perspectives and expertise come together to generate insights and solutions. This collaborative approach not only enriches the understanding of complex issues but also results in the creation of practical knowledge that can be applied to real-world challenges.

LL function to foster holistic thinking, encompassing considerations across the value chain

The co-facilitators emphasized the importance of holistic thinking, including value-chain considerations, to drive transition within the LL context. They stressed the need to comprehensively understand the entire value chain, from production to consumption, to develop effective strategies for change. This holistic view enables the identification of opportunities for change at various stages, facilitating desired outcomes and understanding of how changes can be made at every stage to achieve desired outcomes.

LLs serve to embrace discomfort and welcome diverse perspectives

Participating in LLs may involve stepping out of one's comfort zone and embracing discomfort. Being open to diverse ways of thinking and working is crucial. While this change may require an investment of time and resources, the potential benefits and long-term impact make it a worthwhile endeavour. Participants highlighted the value of diverse perspectives and input from various stakeholders within LLs. This diversity contributes to innovative solutions and approaches for driving transitions. Collaboration among scientists from various disciplines (including economic, social and natural sciences), policymakers, industry representatives, and users fosters a holistic view of challenges and opportunities. In addition, achieving successful transitions in LLs often requires investments in terms of time, resources, and active engagement. Participants acknowledged that transitions are not easy and may be uncomfortable, but the potential benefits and long-term impact make the investment worthwhile. The willingness to invest in the co-creation processes is a key driver of success.

LLs act as a bridge between theory and practice

The discussion on the relationship between theory and practice in the context of transition highlighted two key aspects. Theoretical studies on transition provide the foundational understanding of transition processes, offering frameworks, concepts, and models to elucidate the principles and dynamics of change. On the other hand, LLs complement these theoretical studies by providing practical examples and real-world insights, demonstrating how theoretical concepts are effectively applied in specific contexts. LLs actively involve stakeholders and innovative solutions to highlight the challenges, opportunities, and solutions related to transition, making theoretical knowledge more tangible and actionable for researchers and practitioners.

LLs need to embrace governance and co-creation processes

Effective governance and co-creation processes were also considered by the participants as crucial to supporting innovation within LLs. These processes involve careful management to empower stakeholders, encourage collaboration, and drive successful transformation change by fostering interaction and a shift in mindset. Governance was recognized as a critical factor in facilitating successful innovations within LLs. This governance entails careful management of the co-creation process, which involves collaboration and active stakeholder engagement. Ensuring that stakeholders are empowered and that their input is valued is essential to drive innovation and positive change effectively. Encouraging interaction, building trust, and providing training in co-creation methods was mentioned as key elements to foster successful governance in a LL context.

LLs can drive change through the evaluation of success

LLs are designed to challenge existing ways of thinking, and evaluation helps determine if this transformation is taking place. Evaluation is a multifaceted process that includes quantitative and qualitative data aligned with the LL objectives. It assesses the quality, quantity, and effectiveness of interactions and collaborations among stakeholders. This involves measuring the level of engagement, knowledge exchange, and network building among participants. It serves as a valuable tool for assessing the impact of agroecosystem LLs in achieving their intended goals, including empowerment and innovation. Evaluation helps identify the benefits and challenges associated with LLs. These benefits notably include improved stakeholder engagement, motivation, and collaboration. Challenges involve effective communication, managing expectations, and ensuring that the LL's objectives are met.





To conclude, François Chrétien (AAFC) and Christian Huyghe (INRAE) jointly led the closing plenary session, focusing on the thoughts and insights shared by participants regarding the future of agroecosystem LLs on a global scale.

This first IF-ALL showcased the enthusiasm for the LL approach on an international scale, highlighting its relevance in addressing complex issues within agroecosystems. The oral presentations, scientific posters, networking activities, and discussions around the four themes were extremely insightful. Despite the potential of agroecosystem LLs to address complex issues, this approach is still in its early stages. Since 2018, there have been notable efforts in the establishment of agroecosystem LLs around the globe. However, challenges such as the complexity of agroecosystems, issues related to empowerment and governance within LLs, adapting scientific research to the real-life context, knowledge co-production and exchange, and evaluating the success of LLs need to be further explored to increase the robustness of the approach. Additionally, concerns such as data sharing and harmonization across LL projects need to be addressed. Collaborative efforts among LL scientists, farmers and other partners are crucial to strengthening this approach, unlocking its full potential and helping farmers to adopt sustainable practices on a large scale.

The ultimate vision coming from the attendees is to create a thriving global community of practice centered around LLs. This community will not only emphasize engagement and co-creation but also prioritize the consolidation of scientific knowledge and the sharing of experiences to drive innovation in agroecosystem living labs.

Appendix 1: Oral presentations

Invited speakers

Lessons from building Agriculture and Agri-Food Canada's network of agroecosystem living labs.

Chris McPhee, AAFC, Canada

Living Labs as a key instrument for the transition to sustainable farming: A European Union perspective.

Kerstin Rosenow, European Commission, Belgium

ALL-Ready: Living labs for agroecology transition.

Heather McKhann, INRAE, France

Network for Integrated Resilience Agricultural Research (NIARR): Collaborations on the resilience of agricultural systems.

Shana Sundstrom, University of Nebraska-Lincoln, Center for Resilience in Agricultural Working Landscapes (CRAWL), USA

Living Lab approaches enrich INRAE's strategy for research, partnership for innovation and support to public policies.

Christian Huyghe, INRAE, France

Bridging Land and People to Secure our Future.

Roger Daniels, Mistawasis Nêhiyawak, Living Lab – Bridge to Land Water Sky, Canada

Agriculture Living Labs across LTAR and other USDA ARS Research Networks.

Marlen Eve, United States Department of Agriculture (USDA), Agricultural Research Service (ARS), USA

Agroecosystem Living Labs approach: INTA's strategy to promote territorial innovation processes in Argentina. Eduardo

Cittadini, Instituto Nacional de Tecnología Agropecuaria (INTA), Argentina

Theme 1: Promoting innovation through living labs

Ecological intensification of livestock production in native grasslands: operationalizing "win-win" opportunities in South America's Pampas and Campos grasslands.

Santiago Dogliotti¹, Pablo Soca¹, Gervasio Piñeiro¹, Ignacio Paparamborda¹, Santiago Scarlato¹, Varinia Figueroa¹, Luisina Torres¹, Andrea Ruggia², Verónica Aguerre², Juan Manuel Piñeiro¹, Micaela Abrigo¹, María Marta Albicette¹, Cecilia Jones³, Valentín Balderrín³, Lucía Pais³, Cecilia Márquez³, Felipe García³, Soledad Bergós³

1. Facultad de Agronomía, Universidad de la República, Uruguay, 2. Instituto Nacional de Investigación Agropecuaria, Uruguay, 3. Proyecto GYC, Ministerio de Ganadería, Agricultura y Pesca-FAO, Uruguay

Developing the Organic Field Crop Sector Using the Living Lab Approach: A Story from Abitibi-Témiscamingue (Québec, Canada).

Stéphanie Lavergne¹, Carole Lafrenière¹, Isabelle Ouellet¹, Vincent Poirier¹, Catherine Therrien¹

1. Unité de recherche et développement en agriculture et agroalimentaire, Université du Québec en Abitibi-Témiscamingue

Agroecology Virtual Research Environment as an example of collaboration between Living Labs and Research.

José Manuel Ávila Castuera¹, Iria Soto Embodas¹, Juan Miguel González-Aranda¹

1. LifeWatch Eric, Spain

→ [Download the Full Paper](#)

FOOD Resilience Living Lab (FORELL): a proposed Soil-Food Living Lab linking soil health to food sustainability and climate adaptation.

Achilleas Zalidis¹, Eleni Kalopesa¹, Nikolaos Tziolas¹, Nikolaos Tsakiridis¹, Georgios Zalidis¹

1. University of the Aegean, Greece

Breathing life into rangeland living laboratories in the Western US

Hailey Wilmer¹, Justin D. Derner¹, David Hoover¹, John Ritten², Maria E. Fernandez-Gimenez², Lauren Porensky¹, Gwendwr Merideth³, J. Bret Taylor¹

1. United States Department of Agriculture (USDA)-Agriculture Research Service (ARS), USA, 2. Colorado State University, Fort Collins, Colorado USA, 3. University of Nebraska-Lincoln, Nebraska, USA

Theme 2: Fostering transitions toward sustainable food systems through living labs

Rethinking the support of rural actors in Africa: The Living Lab approach as a lever for territorial agroecological transitions?

Amandine Hertzog¹, Diao Camara Astou², Tamsir Mbaye²

1. French Agricultural Research Centre for International Development (CIRAD), France, 2. Institut Sénégalais de Recherches Agricoles (ISRA), Sénégal

A Conceptual Framework of Living Labs for People: Fostering Innovations for Low-Emissions Food Systems and Social Equity.

Ryan Nehring¹, Wei Zhang¹, Eva M. Valencia Lenero², Thomas Falk¹, Upeksha Hettiarachchi¹, Anne Rietveld³, Lennart Woltering²

1. International Food Policy Research Institute, USA, 2. CIMMYT, Mexico, 3. The Alliance of Biodiversity International and CIAT, Italy

Lessons from the agroecological transition through the implementation of the RVG as living laboratories: case analysis in Boyacá-Colombia.

July Carolina Rojas Gómez¹

1. Universidad Nacional de Colombia, Columbia

Sustainability by chance – consumer co-creation yielding unintended environmental benefits for the food system. Experiences of EIT Food RIS Consumer Engagement Labs project

Krzysztof Klincewicz¹

1. University of Warsaw, Poland

→ [Download the Full Paper](#)

Farmer-led learning: Understanding sustainable transitions in Ontario's potato sector.

Charlotte Potter¹ and Silvia Sarapura¹

1. University of Guelph, Canada

Theme 3: Empowering participation, strengthening participatory governance in living labs

Democratizing interactions with and among food system actors in a newly set-up Agroecology Living Lab in a Mediterranean area.

Luca Colombo¹, Corrado Ciaccia², Mariangela Diacono³, Rosanna Epifani², Angelo Fiore³, Ileana Iocola², Stefania Maurino², Francesco Montemurro³, Alessandro Persiani³, Vincenzo Ritunnano¹, Elena Testani², Stefano Canali²

1. Italian Foundation for Research in Organic and Biodynamic Agriculture (FIRAB), Italy, 2 and 3. Council for Agricultural Research and Economics, Research Centre for Agriculture and Environment (CREA-AA), Italy

Empowering communities to build regional resilience: A case study of the Goulburn Murray Irrigation District in Australia's Murray-Darling Basin.

Ruby Olsson¹

1. Australian National University (ANU), Institute for Water Futures, Australia

Co-design of insect-friendly agricultural landscapes – Results and experiences from a transdisciplinary process in three German landscape labs.

Maria Busse¹, Annette Bartels², Karsten Beutnagel³, Veronika Fick-Haas⁴, Michael Glemnitz¹, Stephanie Holzhauer³, Elke Plaas³, Phillipp Scharschmidt¹, Jens Dauer³

1. Leibniz Centre for Agricultural Landscape Research (ZALF), Germany, 2. Lower Saxony Chamber of Agriculture, Germany, 3. Thuenen Institute of Farm Economics, Germany, 4. Bavarian State Institute for Agriculture, Germany

Open Innovation and transdisciplinary for territorial transitions: the case of the TETRAE Program in France.

Danielle Galliano¹, Pauline Lenormand¹, Frederic Wallet¹

Speaker: Romain Melot¹

1. National Research Institute for Agriculture, Food and the Environment (INRAE), France

Occitanum, an archipelago Living-Lab to evaluate and co-design digital technologies as enablers of the agroecological transition.

Véronique Bellon-Maurel¹, Bergez, J.E.², Bruère, C.², Gobrecht, A.¹, Djafour, S.¹, Compère, P.³, Brun, F.⁴, Foyer Bénos, C⁵, Barthes, S.⁶

1. Université de Montpellier- INRAE-L'Institut Agro, France, 2. Université de Toulouse-INRAE-INP, France, 3. AgriSudOuest Innovation, France, 4. ACTA, France, 5. DRAAF Occitanie, France, 6. CRAO Occitanie, France

Theme 4: Evaluating success in living labs

Knowledge gaps in evaluating the effectiveness and impacts of Living Labs focused on environmental and agricultural sustainability.

Vivian Nguyen¹, Kelly Bronson², Christine Beaudoin³, Albana Berberi¹⁵, Rachana Devkota², Jessika Guay¹, Jean-François Jasmin⁴, Steve Joncoux⁴, Sandra Schillo², Chris McPhee⁵

1. Carleton University, Canada, 2. University of Ottawa, Canada, 3. Université de l'Ontario français, Canada, 4. Centre collégial de transfert du Cégep de Rivière-du-Loup, Canada, 5. Agriculture and Agri-Food Canada (AAFC), Canada

A Multilevel Evaluation Approach of Agroecological Living Labs: The Occitanum Case.

Alexia Gobrecht¹, Flore Barcellini², Véronique Bellon-Maurel¹, Jacques-Eric Bergez¹, Cecile Bruère¹, Pierre-Benoit Joly¹, Jean Larbaigt¹, Giulia Volpini¹, Moustafa Zouinar²

1. French National Institute for Agriculture, Food and Environment (INRAE), France, 2. Conservatoire National des Arts et Métiers (CNAM), France

A customisable tool for monitoring and evaluating transformational change in European Agri-Food Living Labs: ATP-in-ALL "Analysing Transformation Processes within Agroecosystem Living Labs".

Erika Angarita¹, Juern Sanders², Fabian Nuernberger¹, Maria Busse³, Jens Dauber¹

1. Thuenen Institute, Germany, 2. FiBL, Germany 3. Leibniz Centre for Agricultural Landscape Research (ZALF), Germany

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

Erwan Sachet^{1,2,3}, Aurélie Binot^{1,2,3,4}, Genowefa Blundo-Canto^{1,2}, Philippe Lemoisson^{1,2,3,5}, Michel de Garine-Wichatitsky^{1,2,3,6}, Nicolas Antoine-Moussiaux^{7,1,2,3}, Ousmane Samaké⁸, Raphaël Duboz^{1,2,3,9}

1) University of Montpellier, France 2) CIRAD, France 3) INRAE, France, 4) CNRS, France 5) AgroParisTech, France 6) Kasetsart University, Thailand, 7) University of Liège, Belgium, 8) SAED, Senegal, 9) IRD, Sorbonne University, Senegal

→ [Download the Full Paper](#)

Innovation through collaboration: Co-developing ecohydrological indicators in a US rangeland to balance livestock production and conservation in a changing climate.

David Hoover¹, David P. Smith¹, Nicole K. Kaplan¹, Hailey Wilmer¹, David J. Augustine¹, Sean Kearney¹, Lauren M. Porensky¹, Dannele Peck¹, John P. Ritten², Justin D. Derner¹

1. U.S. Department of Agriculture, Agricultural Research Service (USDA-ARS), USA, 2. Colorado State University, USA

Appendix 2: Posters summary

Theme 1: Promoting innovation through living labs

[Living in an Agroecosystem Living Lab: Participant Reflections and Experiences from Canada's Living Laboratories Initiative.](#)

Margaret Bancercz¹, Madeleine Arseneau¹, Ann Lévesque¹, Albana Berberi^{1,2}, Chris McPhee¹

1. Agriculture and Agri-Food Canada (AAFC), Canada, 2. Carleton University, Canada

[Scientific interest groups in France: an innovative multi-stakeholder initiative for collaborative research in agricultural sectors.](#)

Frédérique Angevin¹, René Baumont¹, Camille Billion¹, François Laurens¹, Antoine Messéan¹, Mireille Navarrete¹, Jean-Louis Peyraud¹

1. National Research Institute for Agriculture, Food and the Environment (INRAE), France

[FlNAL: - Facilitating insects in agricultural landscapes: A project to demonstrate the impact of landscape transformation on biodiversity and socio-economic aspects with ALLs in Germany.](#)

Stephanie Holzhauer¹, Bartels, A², Bethwell, C³, Beutnagel, K⁴, Busse, M³, Dachbrodt-Saaydeh, S⁵, Eulenstein, F³, Fick-Haas, V⁶, Gabriel, D⁵, Glemnitz, M³, Häfner, B¹, Kretzschmar, N², Lettow, N⁵, Nürnberger, F¹, Plaas, E⁴, von Steimker, T⁵, Wolfrum, S⁶, Dauber, J¹, et al.

1. Johann Heinrich von Thünen-Institut, Wald und Fischerei (TI), Institut für Biodiversität Germany, 2. Landwirtschaftskammer Niedersachsen (LWK), Germany, 3. Leibniz-Centre for Agricultural Landscape Research (ZALF), Germany, 4. Johann Heinrich von Thünen-Institut, TI, Bundesforschungsinstitut für Ländliche Räume, Germany, 5. Julius Kühn-Institut. Bundesforschungsinstitut für Kulturpflanzen (JKI), Germany, 6) Bayerische Landesanstalt für Landwirtschaft (LfL), Germany

[From waste land to retention ecosystem, a successful living lab adventure.](#)

Jonathan Lafond¹, Andrée Gendron², Georges Thériault¹, Paul Caplette³, Ghislain Poisson⁴, Yasmina Larbi-Youcef⁵, Éloïse Veilleux⁶

1. Agriculture and Agri-Food Canada (AAFC), Canada, 2. Environment and Climate Change Canada (ECCC), Canada, 3. Céréales Bellevue, Canada, 4. Ministère de l'Agriculture, des Pêcheries et de l'Alimentation (MAPAQ), Canada, 5. Fédération de l'UPA de la Montérégie, Canada, 6. Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP), Canada

[ADOPT model predictions in a Canadian context: Estimating future beneficial management practice adoption rates.](#)

Margot McComb¹, Andrew Hartford¹, Michael Sydora¹, Ria Mukherjee¹

1. Agriculture and Agri-Food Canada (AAFC), Canada

→ [Download the Full Paper](#)

Theme 2: Fostering transitions toward sustainable food systems through living labs

[How can living labs contribute to co-create transition pathway towards chemical pesticide-free agriculture by 2050: the example of “la fabrique des transitions en Bergeracois” and wine production.](#)

Claire Meunier¹, Olivier Mora¹, Yann Raineau¹, Cécile Lelabousse², Hubert de Rochambeau¹

1. National Research Institute for Agriculture, Food and the Environment (INRAE), France, 2. INRAE, France, IVBD Interprofession of Bergerac and Duras wines, France

[Participatory modeling of soil carbon dynamics following the adoption of agroecological systems in Quebec, Canada.](#)

Sylvestre Delmotte¹, Guillaume Jégo², Sylvestre Delmotte², Yasmina Larbi-Youcef³

1. Agriculture and Agri-Food Canada (AAFC), Canada, 2) Consultant in participatory modelling, Canada, 3) Union des Producteurs Agricoles (UPA), Canada

[Holos Version 4: A Whole-Farm Model for Estimating Greenhouse Gases and Soil Carbon.](#)

Sarah Pogue¹, Roland Kröbel¹, Aaron McPherson¹, Pamela Mantle¹

1. Agriculture and Agri-Food Canada (AAFC), Canada

[Unique Opportunities for Sustainable Agriculture in Alberta through the Alberta AgriSystems Living Lab.](#)

Brian Karisa¹, Karin Schmid², Vern Baron³, Henry Chau³, Adrienne Heron¹, Kristine Flaim¹, Jodi Flaig¹

1. Alberta AgriSystems Living Lab, Canada, 2) Alberta Beef Producers, Canada, 3) Agriculture and Agri-Food Canada (AAFC), Canada

[Resilience Landscapes as a Vehicle Of Change In Local Food Systems.](#)

Vimbayi Grace Petrova Chimonyo¹, Sieg Snapp¹

1. International Maize and Wheat Improvement Center (CIMMYT), Zimbabwe

The Castor Project of Quebec's Water Strategy—An Agri-environmental Living Laboratory.

Étienne Foulon¹, Alain N. Rousseau¹, André Pion², Daniel Tougas², Sébastien Cottinet³, Karine Dauphin³ et Sophie BélangerComeau⁴

1. Institut National de la recherche Scientifique (INRS), Canada, 2. Équipe locale du projet Castor. 3. Regroupement des organismes de bassins versants du Québec, Canada, 4. Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP), Canada.

→ [Download the Full Paper](#)

Gaps and needs for pesticides reduction in viticulture production. Evidence from Romania in a multi actor value chain assessment.

Iulia-Sorina Dan¹, Iulia Cristina Muresan¹, Ionel Mugurel Jitea¹

1. University of Agricultural Sciences and Veterinary Medicine of Cluj Napoca, Romania

Transitioning from swidden to agroforestry: the role of risks and uncertainties for adaptation to Climate Change in Yucatan.

Mar Moure¹, Birgit Schmook², Carsten Smith Hall¹, Sophie Calmé^{2,3} and Jette Bredahl Jacobsen¹

1. University of Copenhagen, Denmark. 2. El Colegio de la Frontera Sur (ECOSUR Chetumal), Mexico, 3. Sherbrooke University, Canada.

Theme 3: Empowering participation, strengthening participatory governance in living labs

Affordances and improvements of design thinking to support farmers in the process of adaptation to climate change.

Diane Pruneau¹, Abdellatif Khattabi², Sebastian Weissenberger³, Anne-Marie Laroche¹

1. Université de Moncton, Canada, 2. École Nationale Forestière d'Ingénieurs (ENFI), Maroc, Université du Québec à Montréal (UQAM), Canada

A Conceptual Framework for Enhancing Resilience to Climate Change in Ghana's Agriculture and Food Sector through Improved Climate Information Accessibility.

Mark Atta Mensah¹, Chris Gordon¹, Doreen L. Lartey¹

1. University of Ghana, Legon, Ghana.

→ [Download the Full Paper](#)

Effects of Organic Amendments on Soil Health indicators in an Indigenous Farm in the Northern Peace River Region of Canada.

Bharat Shrestha¹

1. Agriculture and Agri-Food Canada (AAFC), Canada

Theme 4: Evaluating success in living labs

Agroecosystem Living Lab, Methodological Proposal for Impact Evaluation.

Pablo Andrés Curarello¹, Daniela Beatriz Iriarte¹, Leonor Maria Pilatti¹, Eduardo Cittadini¹

1. Instituto Nacional de Tecnología Agropecuaria (INTA), Argentina

Using agro living labs as a transition tool: how to measure outcomes? The example of prudent antimicrobial use in European countries and livestock sectors.

Florence Beaugrand¹, Bernadette Oehen², Annick Spaans³, Mette Vaarst⁴

1. Oniris-INRAE, France, 2. FiBL, Switzerland, 3. ZLTO, The Netherlands, 4. ANIS, AU, Denmark

Appendix 3: About the organizers

Agriculture and Agri-Food Canada

Agriculture and Agri-Food Canada (AAFC) is proud to present the first edition of the International Forum on Agroecosystem Living Labs as part of the Adaptation Futures conference. While guiding the growth and development of a competitive, innovative and sustainable Canadian agriculture and agri-food sector, we believe it is important to share knowledge and innovations at an international level in a common effort to strengthen our resilience to climate change.

Institut national de recherche pour l'agriculture, l'alimentation et l'environnement

INRAE, the French National Institute for Agricultural, Food and Environmental Research, is the leading public research organization in France specializing in its three scientific fields. It contributes to meeting the challenges facing humanity, including climate change mitigation and adaptation, food and nutritional security, agricultural transition, natural resource preservation, biodiversity restoration, and risk anticipation and management. Through research, innovation and support to public policies, INRAE proposes new orientations to accompany the emergence of sustainable agricultural and food systems. INRAE's ambition is to provide solutions for life, humans and the earth.

Organizing Committee

Conference Co-chairs

Christian Huyghe, National Research Institute for Agriculture, Food and Environment, France
François Chrétien, Agriculture and Agri-Food Canada

Steering Committee Members

René Morissette, Agriculture and Agri-Food Canada	Jamie Hewitt, Agriculture and Agri-Food Canada
Ann Lévesque, Agriculture and Agri-Food Canada	Joshua Girard, Agriculture and Agri-Food Canada
Bradley Noonan, Agriculture and Agri-Food Canada	Kevin Anderson, Agriculture and Agri-Food Canada
Caroline Rochon, Agriculture and Agri-Food Canada	Luka Kovacec, Agriculture and Agri-Food Canada
Claire Mullen, Agriculture and Agri-Food Canada	Natalie Boulay, Agriculture and Agri-Food Canada
Greta Chiu, Agriculture and Agri-Food Canada	Oussama Turki, Agriculture and Agri-Food Canada
Hervé Guyomard, National Research Institute for Agriculture, Food and Environment, France	Sarah Breton, Agriculture and Agri-Food Canada
	Ines Akué, Agriculture and Agri-Food Canada

Scientific Committee

Chair: Javier Gracia-Garza, Agriculture and Agri-Food Canada (retired)
Muriel Mambrini, Institut de recherche et développement, France
Chris McPhee, Agriculture and Agri-Food Canada
Aude Ridier, Institut Agro Rennes-Angers, France
Eduardo Cittadini, Instituto Nacional de Tecnología Agropecuaria, Argentina
Ionel-Mugurel Jitea, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania
Marlen Eve, Agricultural Research Service, USDA, United-States

Contact Information

Agriculture and Agrifood Canada, Living Labs Division
aafc.livinglaboratories-laboratoiresvivants.aac@agr.gc.ca

Full IF-ALL program : <https://ll-lv.agr.gc.ca/ncloud/index.php/s/ANaM99cPeMJApA4>

Appendix 4: List of organizations that participated in IF-ALL

Organization	Country
Agriculture and Agri-Food Canada	Canada
Alberta Beef Producers	Canada
Aristotle University of Thessaloniki	Greece
Australian National University (ANU), Institute for Water Futures	Australia
Carleton University	Canada
Center for Resilience in Working Agricultural Landscapes / Network for Integrated Agricultural Resilience Research (NIARR)	United States
Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)	France
Consultant Sylvestre Delmotte	Canada
Department of Computer Science, University of Ghana, Legon	Ghana
East Prince Agri-Environment Association	Canada
European Commission	Belgium
Facultad de Agronomía - Universidad de la República	Uruguay
Faculty of Management, University of Warsaw	Poland
Institut de Recherche et de Développement (IRD)	France
Institut national de la recherche scientifique (INRS)	Canada
Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)	France
Instituto Nacional de Tecnología Agropecuaria (INTA)	Argentina
International Food Policy Research Institute (IFPRI)	United States
International Maize and Wheat Improvement Center (CIMMYT)	Zimbabwe
Italian Foundation for Research in Organic and Biodynamic Agriculture (FIRAB)	Italy
Leibniz Centre for Agricultural Landscape Research (ZALF)	Germany
LifeWatch ERIC	Spain
Mistawasis Nêhiyawak	Canada
Network for Integrated Agricultural Resilience Research (NIARR)	United States
Oniris-INRAE	France
Thuenen Institute	Germany
Union des producteurs agricole (UPA)	Canada
United States Department of Agriculture - Agricultural Research Service (USDA-ARS)	United States
Universidad Nacional de Colombia	Colombia
Université de Moncton	Canada
Université du Québec en Abitibi-Témiscamingue (UQAT)	Canada
University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca	Romania
University of Copenhagen	Denmark
University of Guelph	Canada
Washington State University/USDA-ARS	United States