



Canadian Agroecosystem Living Labs (CALL)

Defining Characteristics and Implementation

Building A Horizon Europe Partnership On Agroecology Living Labs And Research Infrastructures

May 07, 2020



Agriculture and
Agri-Food Canada

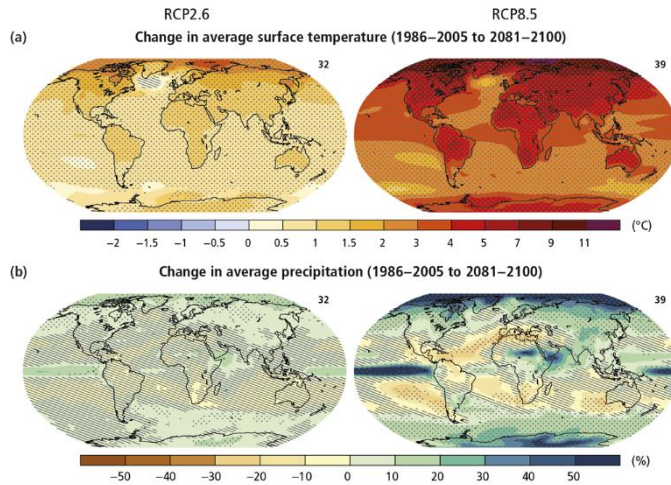
Agriculture et
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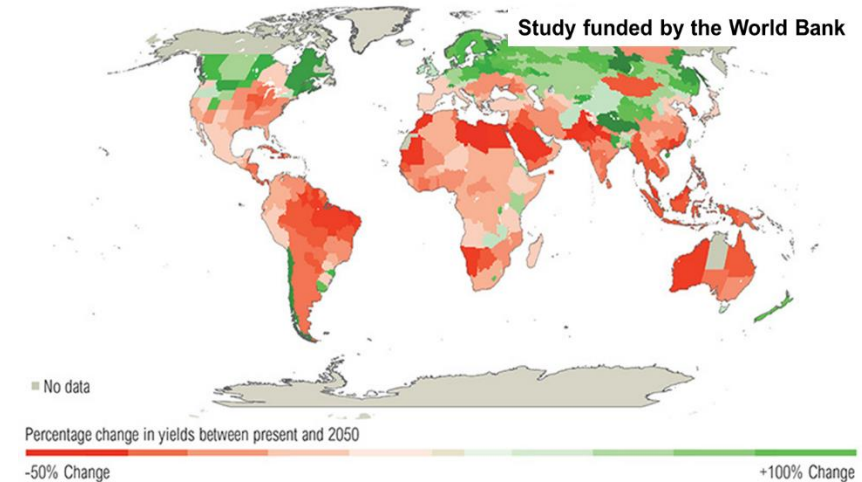
- Context
- What is an Agroecosystem Living Lab?
- Co-developing our Canadian Agroecosystem Living Labs (CALL) Initiative
- Launching our CALL Initiative
- Early Lessons

Challenges facing agriculture

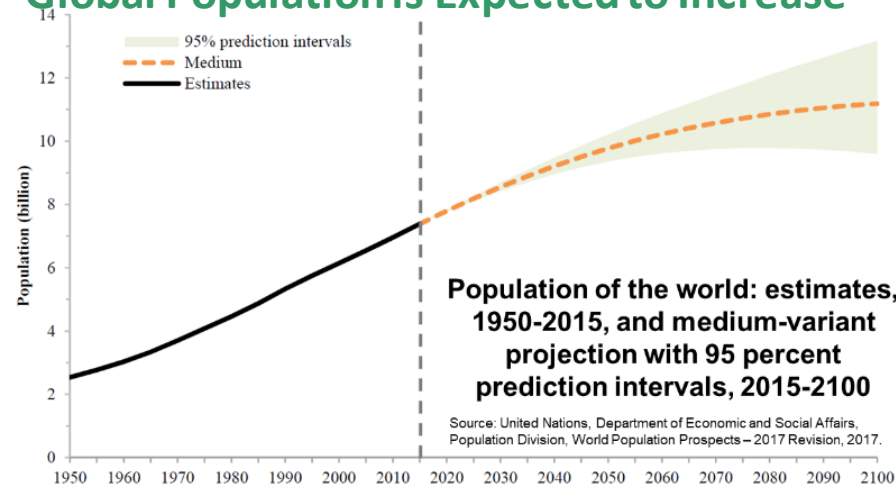
Climate Change is Threatening Agriculture



Adverse Impacts on Crop Yields Projected



Global Population is Expected to Increase



A new approach to innovation is needed

- Traditional agroenvironmental approaches usually don't integrate a comprehensive economic analysis or examine sociological barriers in adopting new agricultural practices or technologies, diminishing the adoption rate of innovation.
- Engagement with Canadian industry identified “Knowledge dissemination and technology transfer” as an area to improve Canada's federal, provincial and territorial research.



What is a Living Lab?

A Living Laboratory is an integrated **approach to agricultural innovation** that bring farmers, scientists and other **partners** together to co-develop, test and monitor BMPs and new technologies in a **real life context**:

- Adjust to climate change
- Reduce water contamination
- Improve soil and water conservation
- Maximize habitat capacity and biodiversity on agricultural landscapes.

The result will be more practical technologies and sustainable farming practices **adopted more quickly** by Canadian farmers.



(Adapted from L'Acadie Lab)

Planning/Targeting

Validate and refine the cycle of innovation (priorities, outcomes, etc)

Co-design

Identify the needs/outcomes – anticipate possible impediments

Exploration/Experimentation

Acquire new data, conduct experiments, develop new knowledge

Evaluation

Evaluate new practice or technology, and adjust based on producer input

Adoption

Take stock of the experiments and the cycle of innovation

Living Labs Principles

- **User centered innovation**
Farmers and scientists work together from start to finish
- **Private-Public-People Partnership**
Experts from various disciplines and backgrounds tackle a common issue
- **Real life experimental setups**
Working farms are the incubators of innovative technologies



The Agroecosystem Living Labs (ALL) Concept

We recognize that the advancement of agroecosystem living labs – in both theory and practice – requires a better understanding of what makes them unique.

The G20 MACS Working Group (2019) defined agroecosystem living labs as:

“**transdisciplinary** approaches which involve farmers, scientists and other interested partners in the **co-design**, monitoring and evaluation of new and existing agricultural practices and technologies on **working landscapes** to improve their effectiveness and early adoption.”

Source: G20 MACS. 2019. *Agroecosystem Living Laboratories: Executive Report*. G20 Meeting of Agricultural Chief Scientists (MACS) International Agroecosystems Living Laboratories (ALL) Working Group.

“The Defining Characteristics of Agroecosystem Living Labs”

AAFC: Chris McPhee, Margaret Bancerz, & François Chrétien

INRAE: Muriel Mambrini-Doudet & Christian Huyghe

To be presented in the Living Labs track at the International Society of Professional Innovation Management (ISPIM) Conference in June 2020

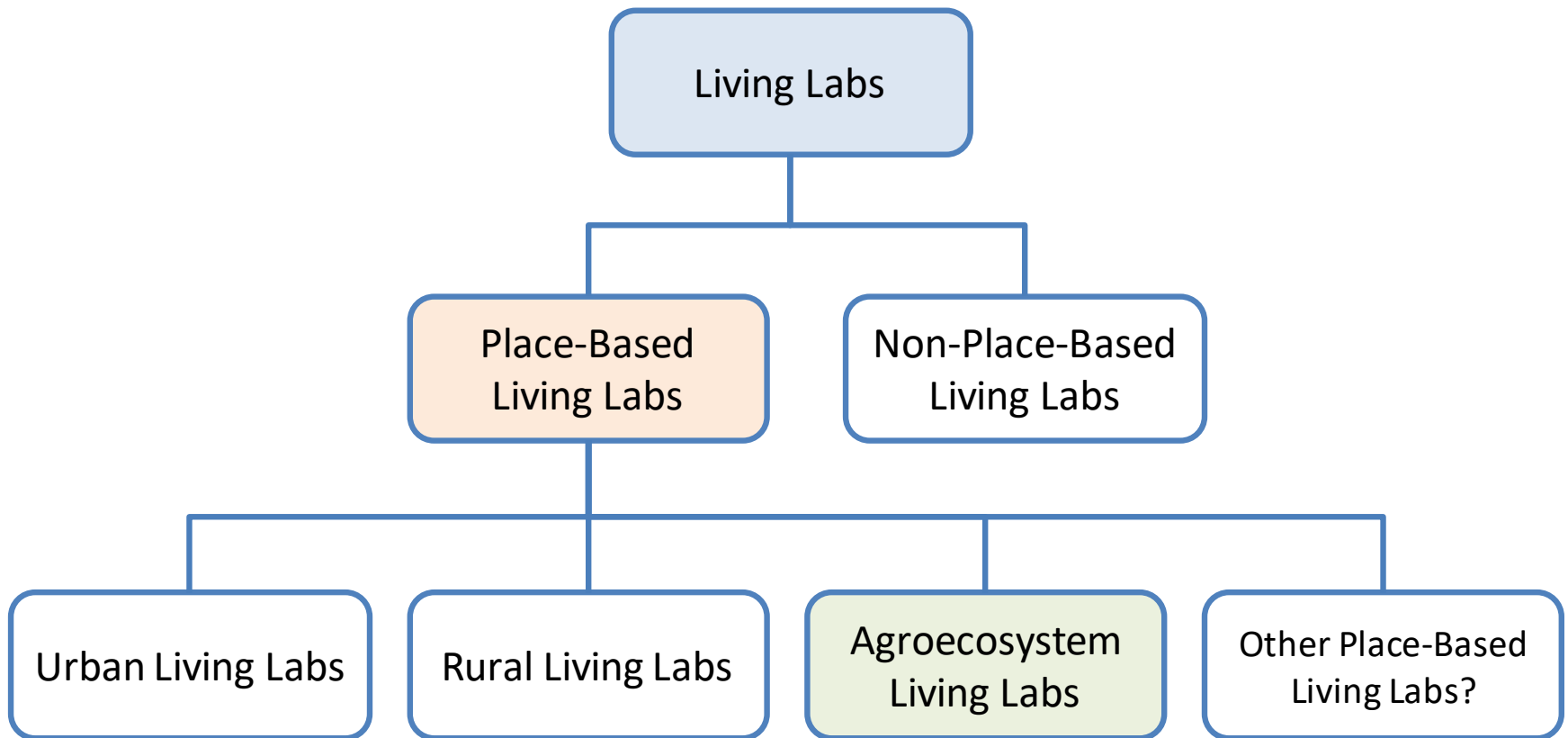
In this paper, we combined case studies from Canada and France with the (very limited) literature on agroecosystem living labs to identify a set of defining characteristics.

Cases:

- Canada’s Living Labs Initiative (AAFC)
- France’s Territoires d’Innovation (INRAE)

A Typology of Place-Based Living Labs

Our paper proposes a new typology of living labs, recognizing that urban, rural, and agroecosystem living labs share important characteristics within a family of “place-based living labs”.



A Framework from Urban Living Labs*

We used a framework developed for “urban living labs” because:

- The literature on urban living labs is well developed.
- Urban living labs focus on *sustainability* and operate at a regional or territorial scale, meaning that *place* is an indispensable feature (as it is with agroecosystem living labs).

The framework defines characteristics along 4 dimensions:

1. Aims
2. Activities
3. Participants
4. Context

*Steen, K., & van Bueren, E. (2017). The Defining Characteristics of Urban Living Labs. *Technology Innovation Management Review* 7(7), 21–33.

Our Proposed ALL Characteristics (DRAFT)

Dimensions	General	Place-Based	Agroecosystem Living Labs
Aims	<ul style="list-style-type: none"> Aimed at innovation Aimed at formal learning / knowledge development 	<ul style="list-style-type: none"> Aimed at sustainability and resilience Aimed at facilitating economic, environmental, and social transitions 	<ul style="list-style-type: none"> Aimed at sustainability and resilience of agri-food systems
Activities	<ul style="list-style-type: none"> Development & experimentation (not just testing) Co-creation Iteration 	<ul style="list-style-type: none"> Scaling up and out as a policy-learning tool Combining economic, environmental, and social dimensions aimed at developing both public and private goods 	<ul style="list-style-type: none"> Exceptionally high level of evaluation and data management Long/seasonal/unpredictable innovation cycles Scaling up and out to outcomes at the level of agri-food systems
Participants	<ul style="list-style-type: none"> Users, public actors, private actors, and knowledge institutes participate directly in the development process All actors have decision-making power (to influence the process) 	<ul style="list-style-type: none"> Prominence of government, community, and citizen roles 	<ul style="list-style-type: none"> Emphasis on public sector researcher participation User roles may be diverse and can evolve Often led by public sector High diversity and number of partners, interests, and values requiring complex governance
Context	<ul style="list-style-type: none"> LL activities take place in the real-life use context 	<ul style="list-style-type: none"> Real-life use context is a territory or space-bound place represented by real communities 	<ul style="list-style-type: none"> Real-life use context is an <i>agroecosystem</i> Transdisciplinarity is promoted

Co-Developing The CALL Initiative

- To be true to the Living Labs co-development concept and innovative approach, five engagement sessions were held across the country in 2018.
- The objectives of these engagement sessions were to introduce the initiative and receive feedback from diverse groups of partners on:
 1. regional environmental health priorities;
 2. potential partners and end-users involvement, roles, responsibilities and contributions; and,
 3. key criteria to be used in site selection processes.
- Results from these sessions were fundamental in defining the roll-out plan and targeting environmental issues that will be investigated through the Living Labs Initiative.

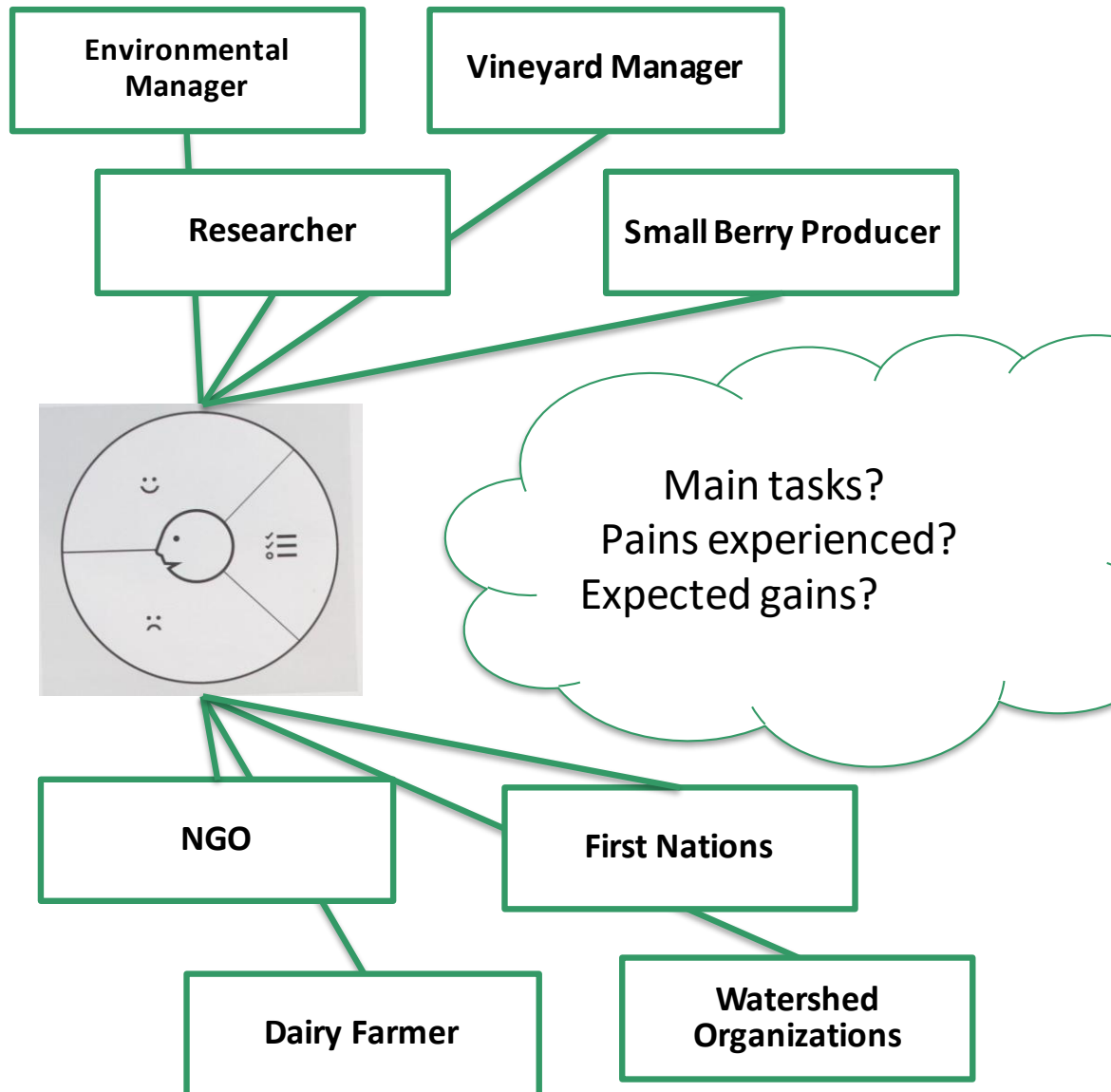


Co-Development Methodology

A methodology was established to facilitate the co-development process in each of the sessions:

- **Activity 1** : Empathy for users and partners
- **Activity 2** : Challenges to be addressed by Living Labs to Strengthen Resilience in Agricultural Landscapes
- **Activity 3** : Sketching Potential Structures and Living Labs Projects
- **Activity 4** : Key Ingredients for Site Selection for Living Labs Projects to Enhance Resilience in Agricultural Landscapes

Activity 1 - Empathy for Users and Partners



Activity 2 - Challenges To Be Addressed By Living Labs

- Identifying Challenges that Can be Addressed by Living Labs to Build Resilience in Agricultural Landscapes.
- Identify what the issues are... individually and then collectively (per table)

Transformez l'enjeu en question "Comment pourrions nous"

How can we?

Parties prenantes / usagers affectés, concernés ou intéressés par cet enjeu :

Engagement (à utiliser plus tard dans l'atelier)



Activity 3 - Living Labs Structures And Projects

Key elements and ingredients of your potential **Living Lab**

sketching **the macro level**

Name your potential LL :

During this workshop

Who is the designer for this project ?

Do you have co-designers ?

Did you recr

Key elements and ingredients of your potential **Living Lab**

sketching **the project level**

Please, name your potential LL (to associate it with the other page):

This Living

- learn

Who are the users in your LL project ?

- narr

What are their contexts?

Real life/realistic,

To observe uses and co-create solutions linked to the theme,

To provide safe space for innovation and influence

Activity 4 – Identification Of Key Ingredients

What are the key elements or ingredients to ensure the success of a Living Lab project?

- Individual reflection
- Ideas were shared at every table, the ideas were then shared to the general group.



Results: Targeted Landscapes and Issues

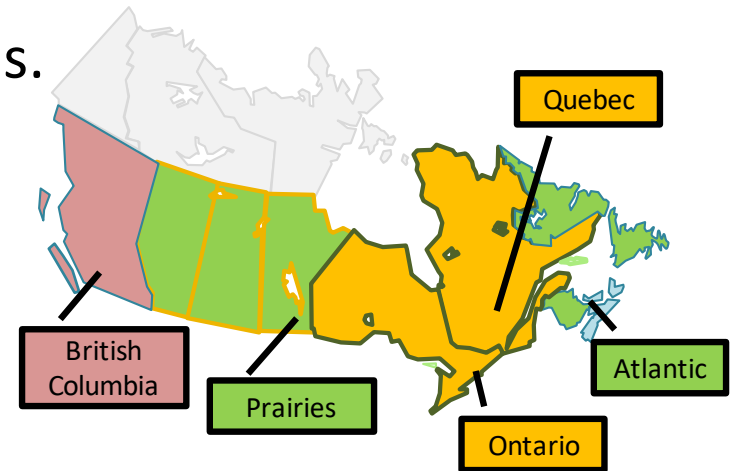
Living Lab	Targeted Landscapes	Regional Agri-environmental Issues
Atlantic Canada	Prince Edward Island	<ol style="list-style-type: none"> 1. Soil conservation 2. Water quality
Prairies	South Eastern Manitoba	<ol style="list-style-type: none"> 1. Water management (quality et quantity) 2. Soil health 3. Habitat conservation 4. Climate change
Quebec	St-Pierre Lake Basin	<ol style="list-style-type: none"> 1. Water quality 2. Land management 3. Biodiversity
Ontario	Lake Erie Basin	<ol style="list-style-type: none"> 1. Water quality 2. Soil quality 3. Watershed management
British-Columbia	To be announced in 2020	

Launching The CALL Initiative

- A \$70 million science investment was approved in June 7, 2018
- The Canadian Agroecosystem Living Labs Initiative (CALL) comprises two different components: **INTERNAL** (to federal gov.) and **EXTERNAL** funding mechanisms.
- **INTERNAL**: to mobilize federal government scientific capacity through calls for **Collaborative federal research project** proposals (management-driven targeted call).
- **EXTERNAL**: to mobilize external partners using AAFC *Living Laboratories Initiative: **Collaborative Program***.

CALL: Implementation Plan

- The Living Labs network of five initial sites is established via a phased implementation.
- Two Living Labs sites were initiated in June 2019:
 - Prairie and Atlantic Canada regions.
- Then, following phases will be:
 - Quebec and Ontario (2020);
 - British Columbia (2021).
- Establishing the network in phases will ensure that the projects achieve the objectives and desired outcomes of the Living Labs Initiative while maintaining an adaptive management capacity.



CALL: Projects

	LL-AT	LL-EP	LL-QC	LL-ON	LL-BC
Status	Active; started April 2019	Active; started April 2019	Under review; to start in 2020	Under review; to start in 2020	To be launched post-COVID
Agri-env. priorities	<ul style="list-style-type: none"> • Soil conservation • Water quality 	<ul style="list-style-type: none"> • Climate change • Water quality • Soil health • Habitat conservation 	<ul style="list-style-type: none"> • Water quality • Biodiversity • Land management (soils and climate change) 	<ul style="list-style-type: none"> • Water quality • Soil quality • Watershed management 	<ul style="list-style-type: none"> • Climate change • Water quality • Nutrient management
Location and number of sites	Five innovation hubs in Prince Edward Island	Four representative sub-watersheds in eastern Manitoba	Three sub-watersheds within the Lac St-Pierre ecosystem	Two sub-watersheds of the Lake Erie Basin	Fraser River Valley (from Hope to Vancouver)
External Lead or Applicant	East Prince Agri-Environment Association (EPAA)	Manitoba Association of Watersheds (MAW) (previously MCDA)	Sole applicant: Union des producteurs agricoles (UPA)	Sole applicant: Ontario Soil and Crop Improvement Association (OSCIA)	TBD

CALL: Projects cont.

	LL-AT	LL-EP	LL-QC	LL-ON	LL-BC
Number of AAFC scientists	2 co-leads 23 scientists	2 co-leads 13 scientists	3 co-leads 23 scientists	2 co-leads 17 scientists	TBD
Number of OGD scientists	7 scientists	5 scientists	3 scientists	13 scientists	TBD
Number of external partners	15 partners	13 partners	13 partners	7 partners	TBD
Total number of participants	~75-85 participants	~40-50 participants	~45-50 participants	~65-70 participants	TBD
Number of complementary activities	<ul style="list-style-type: none"> • 28 internal activities • 13 external activities 	<ul style="list-style-type: none"> • 12 internal activities • 9 external activities 	<ul style="list-style-type: none"> • 16 potential internal activities • 8 external activities 	<ul style="list-style-type: none"> • 12 internal activities • 4 external activities 	TBD
Number of BMPs being investigated	~15 BMPs – cover/nursing crops, crop rotations, irrigation, reduced tillage, wetland, slow-release fertilizer application, precision agr., pesticide reduction, etc	~15 BMPs – grazing/nutrient mgnt, cover crops, veg. strips, tillage, fertilizer and seeding applications, carbon sinks, habitat/biodiversity enhance., water drainage and retention, etc	~15 BMPs – cover/nursing crops, riparian areas, herbicide alternatives, precision animal nutrition, animal waste mgnt, nutrient mgnt, biodiversity, pesticide reduction, etc	~7 BMPs – Cover crops, minimum tillage, rotational grazing, organic implements, nutrient management, biodiversity, pesticide reduction, etc	TBD

E.g.: Atlantic Living Lab Project

- **Agri-environmental priorities** include:
 1. Water quality
 2. Soil conservation
- **Sites:** AAFC Harrington Research Farm, Kensington North Watershed, Dunk River Watershed, McInnis Pond Site (Souris area)
- **INTERNAL Co-Leads | Site Coordinator :** Drs. Yefang Jiang and Judith Nyiraneza | Scott Anderson
- **EXTERNAL LEAD:** East Prince Agri-Environment Association

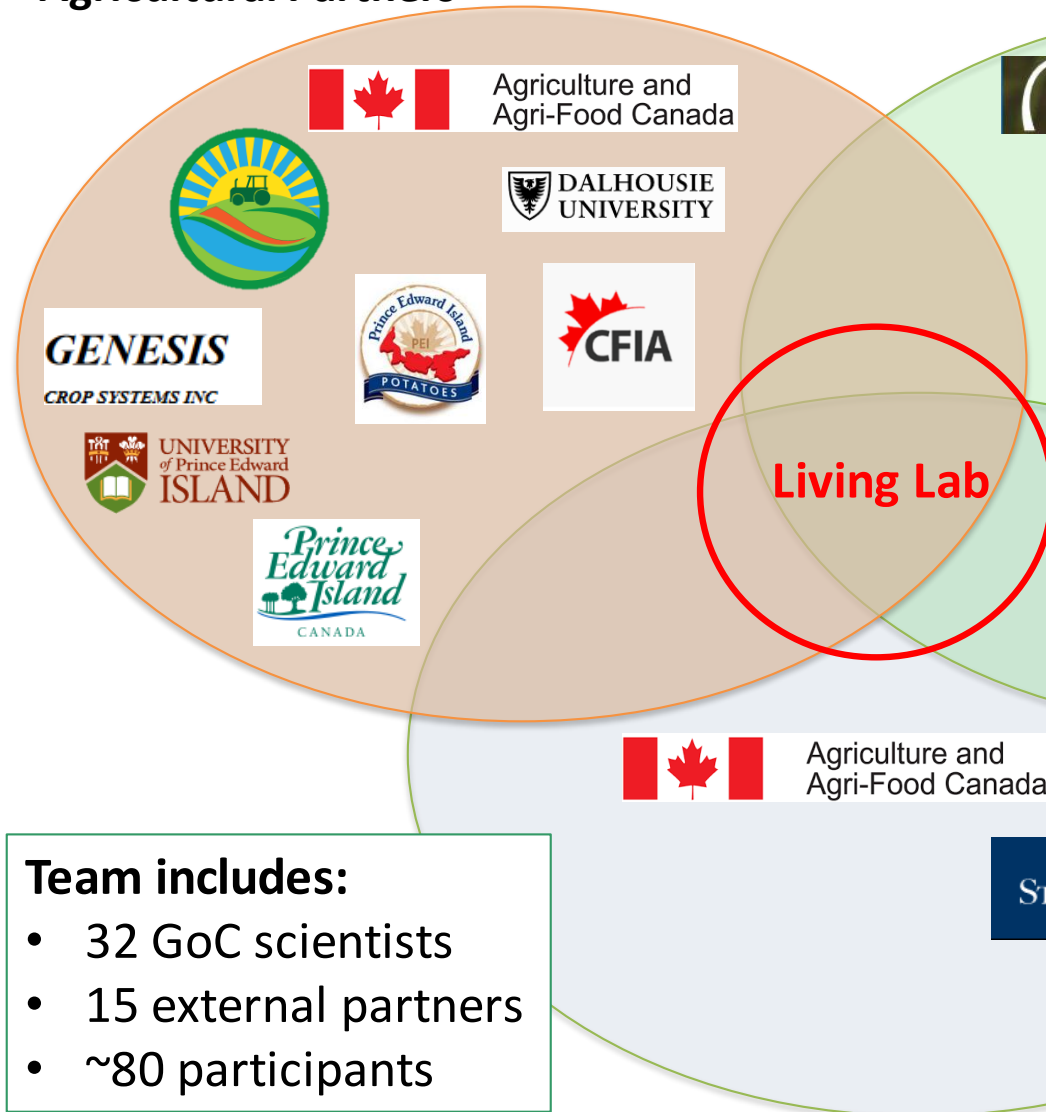
Current status:

- Collaborative Federal Research Project (internal) was approved in April 2019.
- Collaborative Project (external) agreement was signed November 2019.
- Co-development meetings were held in July, Nov 2019 and Jan 2020.



E.g.: Atlantic Living Lab Project cont.

Agricultural Partners



Non-Agricultural Partners

Social and Economics Partners

Team includes:

- 32 GoC scientists
- 15 external partners
- ~80 participants

Living Labs Iterative Process

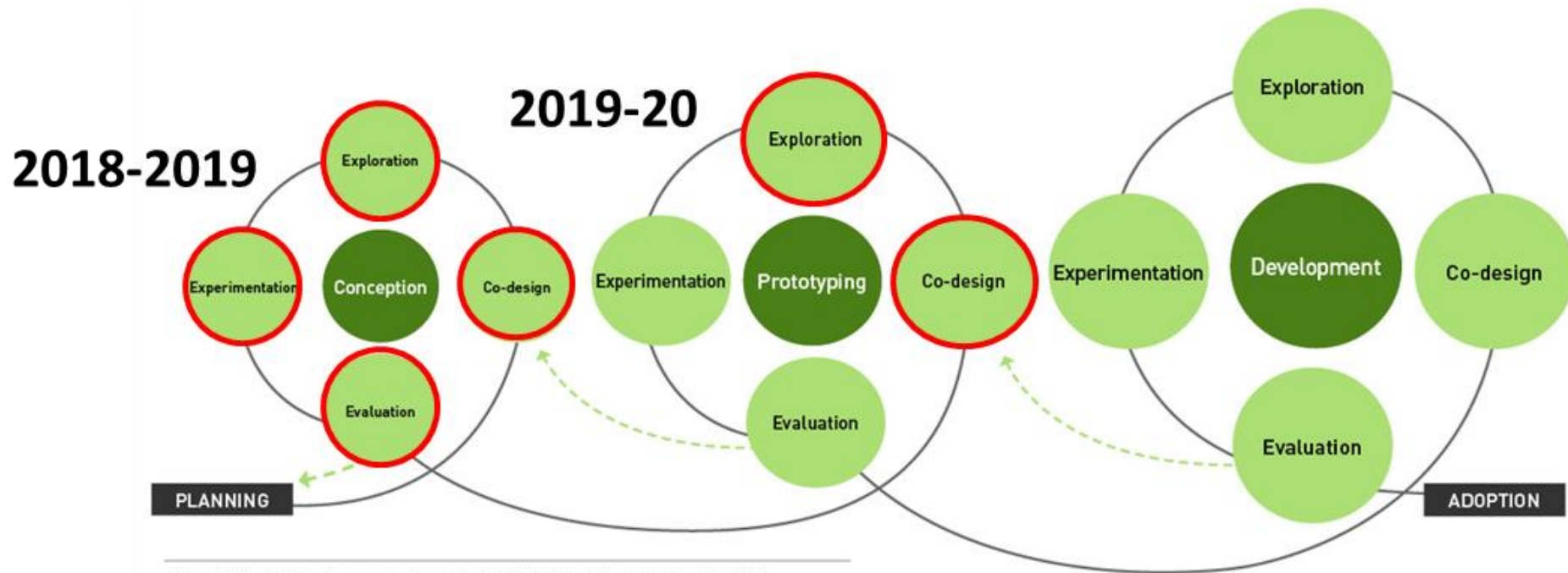
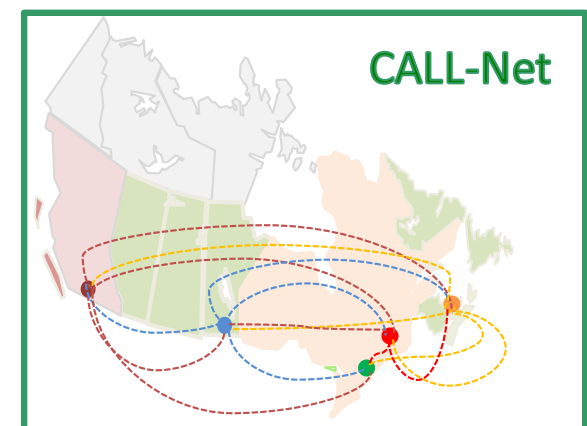


Figure 1 Living Lab iterative process. Inspired by UMVELT (Le livre blanc des Living Labs, 2014)

- To support cross-collaboration a **Canadian Agroecosystem Living Labs Network** (CALL-Net) is being established and is supported by AAFC's **Living Labs Division**.
- **Mission:** is to facilitate national multi-site and international scientific collaborations and accelerate the growth of the Network.
- A **Data Management Strategy** has been developed and is being implemented
- **Working groups** are being established on environmental and cross-cutting themes.



Early Lessons

We are working through the challenges of implementing a complex approach to a complex challenge. However, we already see the opportunities of using this approach to enable culture change and a paradigm shift within a research organization.

Early lessons shared by those leading the research sites focus on:

1. A new way of working
2. Partnership and collaboration
3. Communication and coordination

1. A New Way of Working

- This approach requires more work and takes longer, but shows promise in network building and on-field results
- Signs of culture change: participants collaborating *differently*
- Flexibility and openness must be encouraged and nurtured.



2. Partnership and Collaboration

- Strong trusting relationships are crucial to living labs work
- Clear and common group objectives for system-level outcomes



3. Communication and Coordination



- Ongoing need to explain “why we are doing things differently”
- Regular communication (formal/informal) is essential to build relationships and establish trust
- Coordination and leadership skills are necessary to synchronize the many participants, partners, and perspectives involved

Questions and Answers

