AGRICULTURAL CLIMATE SOLUTIONS

Lessons from Building Agriculture and Agri-Food Canada's Network of Agroecosystem Living Labs

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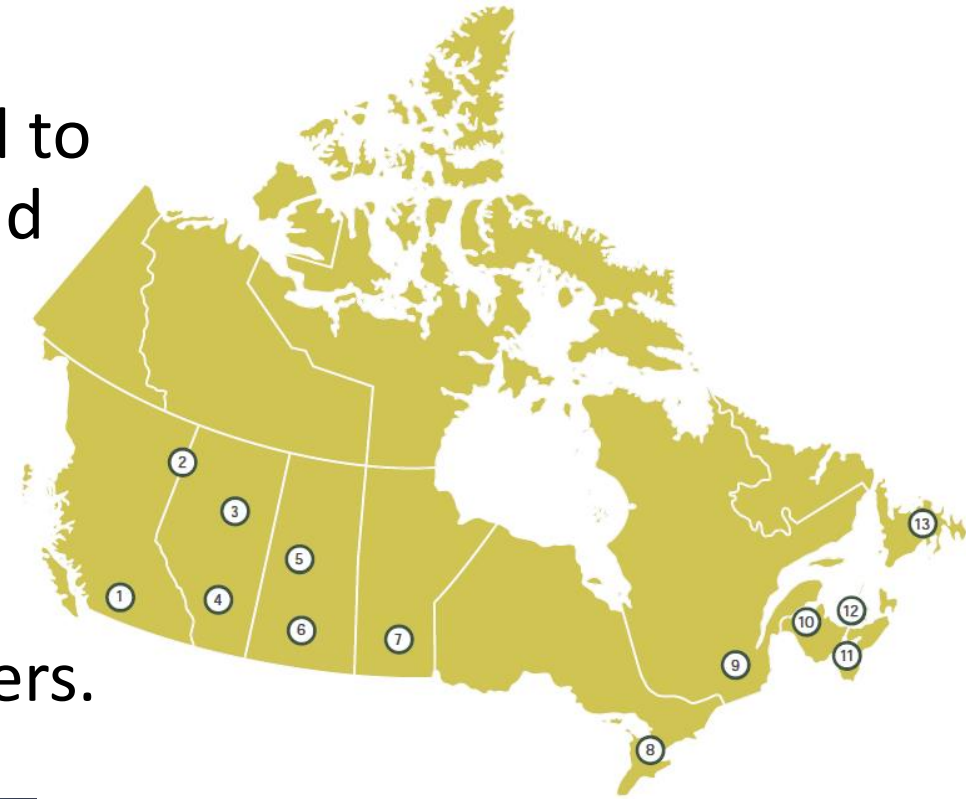Agriculture and Agri-Food Canada · Agriculture et Agroalimentaire Canada

Canada

Living Labs at Agriculture and Agri-Food Canada

AAFC recognized that urgent action is needed to accelerate our response to climate change and other agri-environmental challenges.

Starting 2018, AAFC launched **a nationwide network** of living labs to help accelerate the development and adoption of sustainable practices and technologies by Canadian farmers.

Agriculture and Agri-Food Canada

Two Programs: One Approach

Living Laboratories Initiative	Agricultural Climate Solutions – LLs

- Living labs in 4 regions (PEI, MB, ON, QC)
- Focused on agro-environmental issues

- Goal: at least 1 living lab in each province
- Focused on carbon sequestration, reducing GHG emissions, and providing other environmental co-benefits
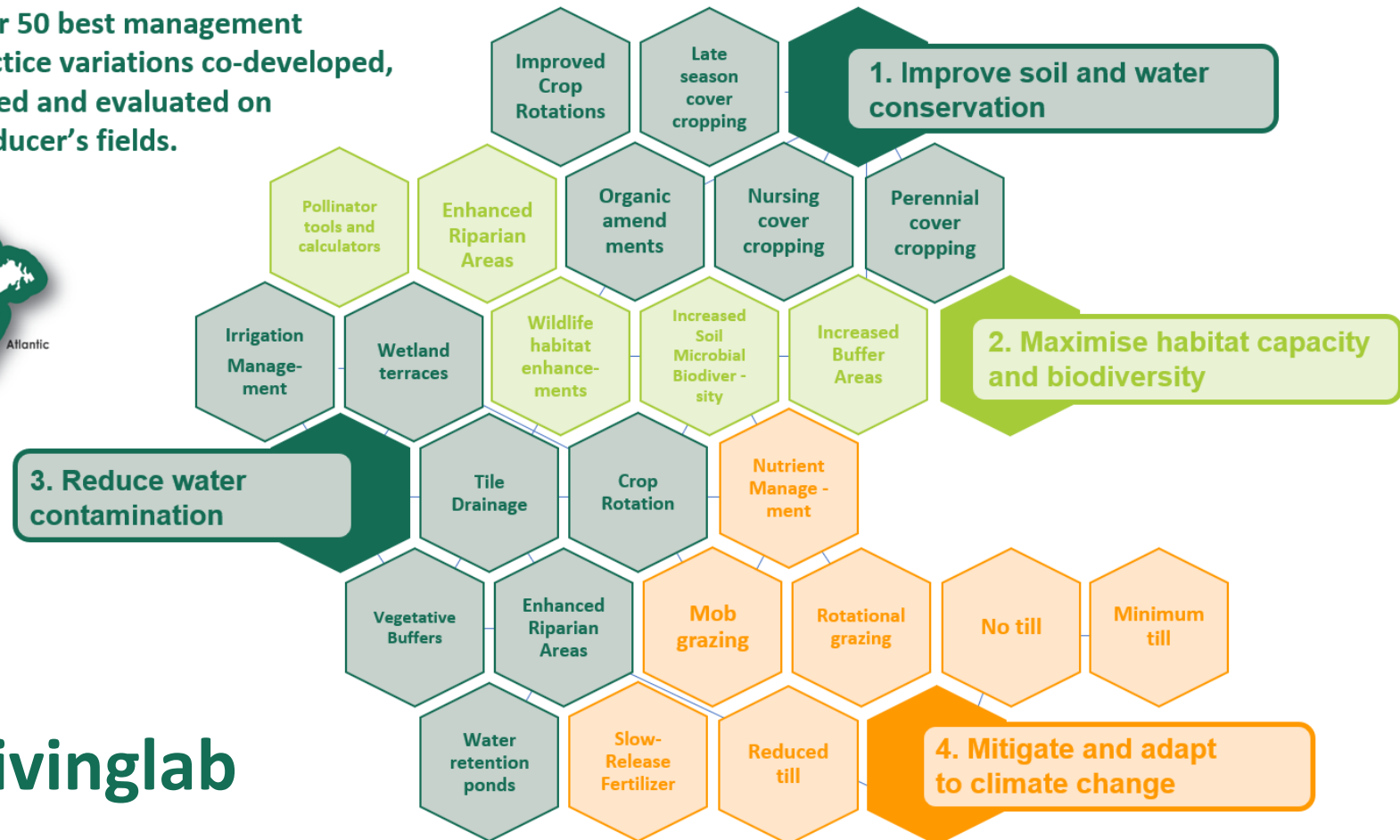
5 years $24 million

10 years $185 million

2018   2021   2023   2031
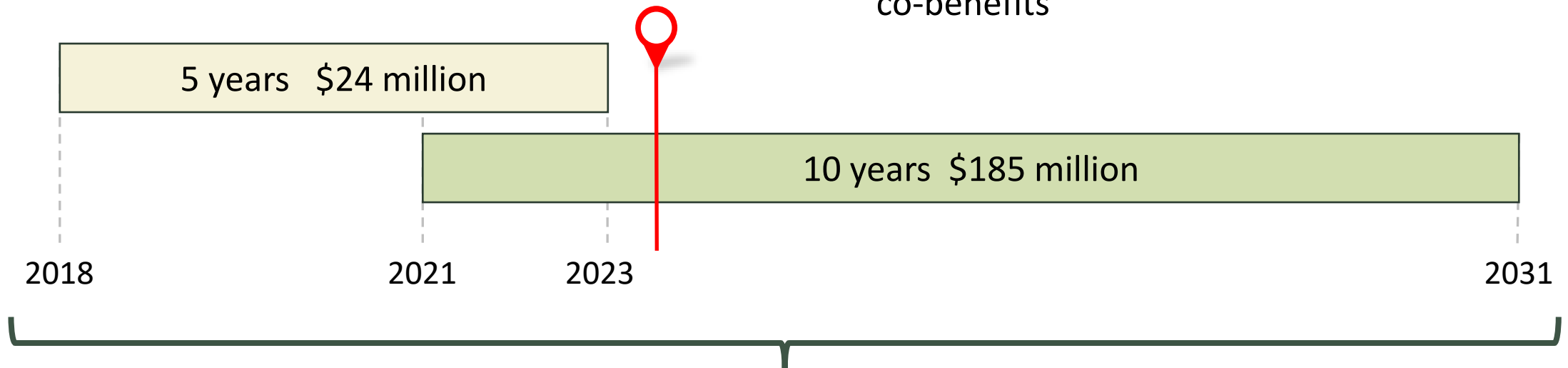
Both programs follow the same agroecosystem living lab approach

Living Laboratories Initiative (2018–2023)

Over 50 best management practice variations co-developed, tested and evaluated on producer's fields.

Eastern Prairies
Atlantic
Quebec
Ontario

Improved Crop Rotations
Late season cover cropping
1. Improve soil and water conservation

Pollinator tools and calculators
Enhanced Riparian Areas
Organic amendments
Nursing cover cropping
Perennial cover cropping

Irrigation Management
Wetland terraces
Wildlife habitat enhancements
Increased Soil Microbial Biodiversity
Increased Buffer Areas
2. Maximise habitat capacity and biodiversity

3. Reduce water contamination
Tile Drainage
Crop Rotation
Nutrient Management

Vegetative Buffers
Enhanced Riparian Areas
Mob grazing
Rotational grazing
No till
Minimum till

Water retention ponds
Slow-Release Fertilizer
Reduced till
4. Mitigate and adapt to climate change

www.agr.gc.ca/livinglab

Agricultural Climate Solutions – Living Labs

- New 10-year program (2021–2031)

- Focused on carbon sequestration, reducing GHG emissions, and providing other environmental co-benefits

- Rapid scale-up from 4 to 13 living labs

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**agriculture.canada.ca/agricultural-climate-solutions**

Scaling Up: The Numbers

	Initial Network (LLI)		Now (ACS)
Living Labs	4	→	13
Timelines	5 years (2018–2023)	→	10 years (2021–2031)
Participants	~250 people	→	>1000 people
Partners	50	→	150
Provinces	4 provinces	→	10 provinces
Research Centres	12	→	21
Funding	$24 million	→	$185 million
Innovations	~60	→	~200

Defining Characteristics of Agroecosystem LLs

Dimensions	Characteristics
Aims	• Aimed at sustainability and resilience of agriculture and agri-food systems • Innovation can be expressed through technology, beneficial management practices, or processes • Knowledge production and knowledge network creation
Activities	• **Exceptionally high level of evaluation and data management** • **Long/seasonal/unpredictable innovation cycles** • **Scaling up and out to system-level outcomes**
Participants	• **Emphasis on public sector researcher participation** • User roles may be diverse and can evolve • Often led by the public sector academic institutions • **High diversity and number of partners, interests, and values requiring complex governance**
Context	• The living lab is embedded within and examined at the scale of *agroecosystems*
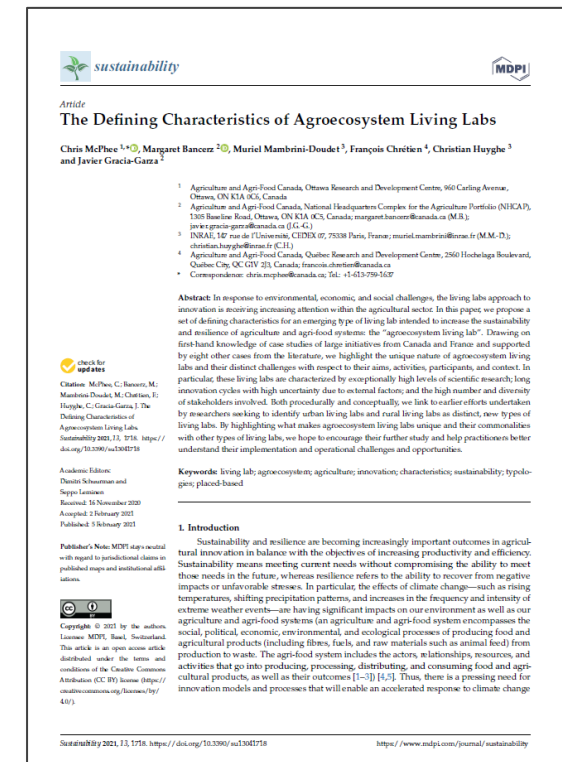
Source: The Defining Characteristics of Agroecosystem Living Labs. McPhee, C.; Bancerz, M.; Mambrini-Doudet, M.; Chrétien, F.; Huyghe, C.; Gracia-Garza, J. 2021. *Sustainability,* 13, 1718.

Lesson 1: Learning to Sprint Slowly

Characteristics

- Year-long innovation cycles
- Seasonal activities
- Unpredictability
- Co-creation and knowledge exchange

Living Lab – Ontario

Living Lab – Eastern Prairies + USDA/LTAR

Lesson: There is a tension between the *urgency* to develop effective solutions and the *patience* required for trusting collaborative relationships to develop for effective co-creation.
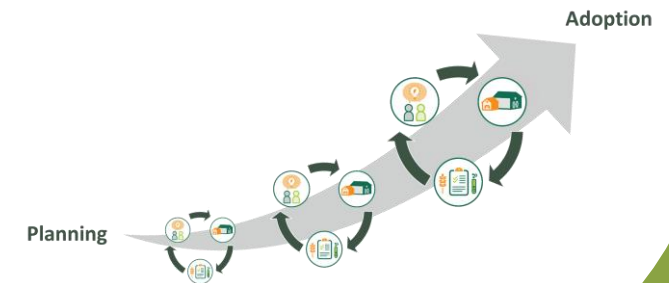
→ **Innovation focus + Relationship building**

Lesson 2: Complexity and Diversity

Characteristics

High diversity and number of partners, interests, and values requiring complex governance

Lesson: Complexity and diversity are success factors for agroecosystem living labs, but they also make implementation very challenging.

- Coordination and integration of activities
- Transaction-intensive (e.g., meeting fatigue)
- Additional benefits (e.g., network resiliency)

Living Lab – Atlantic

Living Lab – Quebec

Lesson 3: The Role of Research(ers)

Characteristics

Emphasis on public sector researcher participation

Lessons: Involving producers throughout the user-centred innovation process and continually focusing on their needs ensures high relevance of the supporting research. But we should not underestimate the challenges for the researcher in a reactive, iterative, dynamic environment.

Living labs are not research projects; they are innovation projects supported by research.

Living Lab – Atlantic

Lesson 4: Evaluation & Data

Characteristics

Exceptionally high level of evaluation and data management

Lessons: Strong technological solutions are essential, but the legal, human, and organizational dimensions are also important (e.g., agreements for sharing, processes, reporting, capacity).

Evaluation should focus on improvement, not just reporting what happened.

Lesson 5: Scaling Up and Out

Local and Regional:

- Knowledge exchange within and beyond the living labs

National:

Network approach:
- 13 living labs
- 9 working groups
- >1000 participants

International: …and more

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