

EXPLORING COLLABORATIVE INNOVATION APPROACHES AS CO-PRODUCTION POLICY TOOLS: LEARNING FROM CANADA'S AGROECOSYSTEM LIVING LABS

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ABSTRACT

In 2018, Agriculture and Agri-Food Canada developed the Living Laboratories Initiative, a network of agroecosystem living labs, to encourage the adoption and scaling up and out of innovation in climate change adaptation and mitigation in agriculture. This paper explores agroecosystem living labs as new collaborative innovation approaches used as co-production policy tools to co-create solutions to complex agri-environmental issues. It answers the question: How can living labs, especially agroecosystem living labs, help us understand more about the co-production processes between public and private actors? Using a combination of semi-structured interviews and participant observation, this study gathered early-stage insights from various agroecosystem living lab partners in two Canadian agroecosystem living lab sites. It found that starting conditions of partners are informative in the initial stages of living lab implementation. Three lessons are identified for other public sector actors looking to use living labs as co-production tools targeting agroecosystems: first metagovernance is essential to a well-functioning agroecosystem living lab; second, it is useful to regularly reflect on power balances within the living lab and closer self-reflection by the metagovernor is important; lastly, social iteration is a useful "check-in" tool to use in addition to any other innovation iterations in the living lab.

Keywords - agroecosystem living labs, collaborative innovation, co-production, collaborative governance

INTRODUCTION

Climate change has become a globally defining policy issue touching on ecological, social, and economic aspects of our collective society, as well as threatening humanity's very existence. Governments struggle to deal with these global interconnected issues because of their complexity. Many argue that given the rising complexity of issues we are facing today, like climate change, governments alone cannot develop the required coordinated solutions needed for these large and complex issues (Crosby, Hard & Torfing,

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2017). Several governments around the world are focusing on mitigating and adapting to climate change in different ways and using different approaches and policy tools.

Classical public administration (CPA) and new public management (NPM) systems have offered few tools and approaches to tackle wicked policy problems like climate change. Since these problems cannot be solved with more money or traditional hierarchical and siloed solutions (Rittel & Webber 1973), they require innovative policy solutions (Head & Alford 2015; Sørensen & Torfing 2011). While innovation in the public sector was already being pushed within NPM, it largely centred on market-based public-private partnerships focusing on economic efficiency in service delivery.

Public innovation is increasingly occurring in collaborative arrangements that include both state and non-state actors (Bekkers & Tummers 2018). Some authors have identified collaborative governance as a way to achieve innovation, or the “development and implementation of new ideas” (Torfing 2016, p. 2) within the public sector to tackle complex problems (Bommert 2010; Jukić, Pevcin, Benčina, Dečman & Vrbek 2019; Sørensen & Torfing 2011). One type of collaborative governance arrangement focusing on public innovation through co-production is living laboratories (LLs). LLs are multi-actor participatory networks that foster open innovation through co-creation and co-production with users of innovations and other partners. LLs can innovate technologies, products, processes, and services in real-life contexts (García Guzmán et al. 2013; García-Llorente et al. 2019; Westerlund & Leminen 2011). Co-production has been a box of policy tools used to “promote collaborative forms of governance to implement policy goals (Howlett, Kekez & Poocharoen 2017, p. 491). One area of research needed in LLs and public innovation is quantitative and qualitative studies that “explore and understand the needs and expectations of different stakeholders in public open innovation processes” (Gascó 2017, p. 97) which can provide insight into opportunities and challenges impacting LL success.

In its fight against climate change, the Government of Canada has recently developed a climate change lens to reduce greenhouse gas emissions in many sectors, including agriculture. One way in which the government is doing this is by developing agroecosystem LLs across the country through the Living Laboratories Initiative. This is a network of agroecosystem LLs that are being implemented to accelerate solutions to climate change and other agri-environmental issues in an effort to scale up and out many of the beneficial management practices (BMPs) developed through it. Agroecosystem LLs are defined by the International Agroecosystem Living Laboratories Working Group 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 (International Agroecosystem LL Working Group 2019, p. 4).

This study focuses on two LL sites in the LLs Initiative in Canada led by Agriculture and Agri-Food Canada (AAFC): the Atlantic LL located in Prince Edward Island, and the Eastern Prairies LL located in Manitoba. While at the time of data collection these agroecosystem LLs were quite new, the cases that will be discussed in this paper provide insight into how co-production can unfold in early days of collaboration. As Howlett, Kekez and

Poocharoen (2017) note, in order to analyze co-production, its design and implementation is needed to determine how the process works and what is needed for its success. This paper draws on Canada's Living Laboratories Initiative as a case study to answer:

How can living labs, especially agroecosystem living labs, help us understand more about the co-production processes between public and private actors?

I do this by first grounding the study in different bodies of literature drawing on changes in public management to contextualize policy changes in the New Public Governance (NPG) system leading to more collaborative forms of policymaking, and collaborative policy tools including co-production and LLs. Second, I introduce my case study, followed by the research methods. Next, I discuss my findings and analyze them by answering my research question and concluding that in the LL Initiative, starting conditions provide important insights in the early collaborative process. Three lessons are identified for other public sector actors looking to use LLs as co-production tools targeting agroecosystems: first, metagovernance is essential to a well-functioning LL; second, regularly reflecting on power balances within the LL and closer self-reflection by the metagovernor (public actor) is important; lastly, "social iteration" is a useful "check-in" tool to use in addition to any other technical iterations in the LL.

It is important to note that this is not an evaluation of the initiative and does not intend to be in any way. As will be discussed further, the initiative continues to be in its infancy, and the results and discussion should be understood in this way – as a preliminary analysis of a new and complex approach. The purpose of this paper is three-fold. First, to encourage reflection on factors influencing the collaborative process within the LLs. Second, to merge public policy and public administration fields, contributing to an emerging literature on public-sector driven LLs by highlighting how collaborative processes can be impacted by the state as the "metagovernor" of the collaborative arrangement. Third is to provide general lessons from agroecosystem LLs to consider for other state actors currently implementing or looking to implement co-production policy tools like LLs.

CONCEPTUAL BACKGROUND

Context: Public Management System Changes

Between the 1970s and 1990s, as neoliberal ideas were taking hold, there was a big push for business-like approaches in the public sector to counter the issues of "big government" found in CPA management systems (Dickinson 2016). This changed the way governments were structured and how the state interacted with its citizens. As more public services were transferred to the private sector, governments became increasingly "hollowed out" and fragmented, and the discretion and influence of public servants was reduced (Dickinson, 2016). This gave rise to "governance", a form of governing where "government" is no longer the sole actor developing and implementing policies (Kooiman 1993; Pierre and Peters 1998). These political-economic changes prompted the rise of NPM, a set of managerial reforms focused on nimbleness, efficiency and effective performance based on private-sector management approaches (Masou 2017; Osborne 2010). These reforms were identified as a way in which governments could do more with less, becoming

more effective and legitimate (Bekkers, Edelenbos & Steijn 2011). While NPM encouraged innovation (as it was understood in the private sector), it also created a number of obstacles to public innovation stemming from fragmentation in governance and strong use of market principles that undermined public innovation (Hartley, Sørensen & Torfing, 2013).

Over time, given the fragmentation of service delivery and policymaking, the number of policy networks increased as different public and private players needed to collaborate to deliver required policy and services. These networks began developing clusters of a different public management system termed NPG (Dickinson 2016). NPG presented what Osborne (2010) called a plural state, where multiple actors contributed to and delivered public services, and a pluralist state, where several different public policy processes informed the state's policymaking. NPG adopts a governance style that encourages collaboration, participation, and co-production, emphasizing the improvement of processes and outcomes in policymaking and delivery (Torfing & Triantafillou 2013). Some authors like Weber, Cabras, and Frahm (2019) have identified waves of de-privatization, especially in environmental areas, where governments have participated in "commoning", or the "transfer of private goods and services into common-based forms of ownership" (p. 2). These governing changes are occurring in response to the over marketization and privatization of many public goods and services under NPM. Through NPG's emphasis on participation and collaboration, there may be more instances of "commoning", especially involving complex and wicked policy problems.

These different forms of public administration are not exclusive, and they often co-exist in differing capacities drawing from CPA, NPM, and NPG simultaneously, creating a hybrid (Dickinson, 2016). Policymaking and service delivery will therefore exist within a hybrid arrangement of all three forms of public management systems.

Collaborative Governance, Innovation, and Co-Production

While innovation was not a new concept in government, most innovation processes followed the hierarchal structures of government fostering siloed thinking which ultimately stifled public innovation (Sørensen & Torfing 2011). For this reason, networks of different actors encouraging collaboration are identified as reawakening public innovation. Governments began to borrow the idea of "open innovation" from the private sector with a key focus on innovation intermediaries as an approach that encouraged both internal and external partners to solve issues, and (re)invent products, services, or models (Chesbrough 2003; Gascó 2017). This process also increased the permeability of organizational borders allowing knowledge to flow in and out of the organization, a trend that led to better innovation outcomes (Felin & Zenger 2014).

Collaborative governance is one type of governance design under NPG that accentuates the need for collaboration, but also maintains the need for the involvement of the state in policymaking (Torfing 2016). Ansell and Gash (2008) define collaborative governance as,

A governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-

oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets (p. 544).

A new form of public innovation has been introduced under NPG involving governance innovations linked to process, multi-actor decision-making and contributions, and normative standards of performance evaluation. Following discussions on public open innovation and the increase in collaborative governance arrangements, Sørensen and Torfing (2011) conceptualized "collaborative innovation". Nambisan (2008) defines collaborative innovation as:

A collaborative approach to innovation and problem solving in the public sector that relies on harnessing the resources and the creativity of external networks and communities (including citizen networks as well as networks of nonprofits and private corporations) to amplify or enhance the innovation speed as well as the range and quality of innovation outcomes (p. 11).

Collaborative innovation processes are meant to be designs to develop and implement novel creative solutions to various governance challenges, particularly suited to wicked policy problems and limited resources (Wegrich 2018) because the complexity of issues can be explored between different actors (Bommert, 2010; Sørensen & Waldorff, 2014). Under NPG, there has been a shift in the use of policy tools from very marketized instruments, to ones that emphasize co-production with non-state actors, public participation, collaboration, inclusivity, and legitimacy (Howlett, Kekez & Poocharoen 2017). These processes differ from traditional policymaking processes because they focus on:

reframing existing problem definitions; searching, creating, and valuing new, untried, and creative ideas and interventions; discovering what works through logic of experimentation driven by quick, rich, and no-blame feedback loops that facilitate fast learning, and iterative processes of design, assessment, and diffusion (Crosby, Hart & Torfing 2017, p. 657).

One form of collaborative innovation is co-production which develops "novel ways of creating and providing public services" (Agger & Lund 2017, p. 17) by including external to government actors in public value creation that is beyond classic forms of participation such as consultation (Jukić et al, 2019). Co-production as a concept generally lacks clarity and consistency in the literature. It has also been conceptually overlapped with co-creation, and while Jukić et al (2019) attempt to unravel these two concepts, they ultimately call for a need for more conceptual clarity in the literature. However others like Hardyman, Daunt, and Kitchener (2015) argue that co-creation can stem from co-production. While co-production as a concept initially emerged during the years of NPM signaling the service delivery relationship between public and private actors (Howlett, Kekez & Poocharoen 2017; Nesti 2018; Pestoff & Brandsen 2010), under NPG, co-production remains relevant. It emphasizes a pluralist approach to service and goods delivery through involving participants external to government not for the purpose of efficiency, but for the improvement of policy outcomes (Nesti 2018). Users of services are engaged in co-production to "contribute their experience and knowledge to define and create services really targeted on their needs..." (Nesti 2018, p. 269). Nesti's (2018) broad understanding of co-production includes the private sector, the third sector, and citizenry participating

with the public sector to shape and define the delivery of goods and services that are better aligned with the needs of those receiving those same goods and services. Co-production as a concept has evolved to include a larger swatch of participants as well as the design, management, and delivery of services (Howlett, Kekez & Poocharoen 2017). In this case, co-production will be understood as a *collective* co-production, which aims to co-produce societal benefits, not just benefits for the user (Sorrentino, Sicilia & Howlett 2018). Under NPG, co-production is identified as a “managerial device” as well as a “set of policy tools” (Howlett, Kekez & Poocharoen 2017, p. 490), where Nesti (2018) specifically associates LLs with co-production.

Living Laboratories (LLs) and Agroecosystem Living Laboratories

The LL is an open innovation approach that has become a popular tool in many European governments’ toolbox for public innovation. It was popularized after the launch of the European Network of Living Labs (ENoLL) in 2006 by then Finnish President of the European Union (EU). At that time, the European Commission was promoting LLs as a way to improve “EU competitiveness and growth” (Nesti 2016, p. 271) especially in information-communication technologies and smart cities (Nesti 2016). Since then ENoLL has continued to grow, not only in Europe, but around the world. More recently in 2019, the European Commission proposed a new partnership on agroecology LLs under Horizon 2020 with the goal of supporting a network of LLs and research infrastructures to promote a fast-tracked transition to agroecology in Europe (European Commission, n.d.).

The ENoLL defines LLs “as user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings” (ENoLL 2020). Dekker, Contreras and Meijer (2019) identify a LL as a methodology for experimentation and innovation as well as a physical space where this happens. LLs emphasize open and user-centred innovation, noting the need to bring different partners together at the beginning of the process to innovate in the real life contexts of users (Hossain, Leminen & Westerlund 2019). Comparing LLs with other forms of design labs or innovation, LLs place a heavy emphasis on “iterative ways of learning-by-doing” (Dekker, Contreras and Meijer 2019, p. 9). While there are many different types of LLs and several ways of classifying them, Leminen, Westerlund and Nyström’s (2012) understanding of LLs is based on the driver of the network of partners which is particularly useful for our conceptualization of LLs in this paper. One type of LL network they identify is the “enabler-driven” LL, which is often led by public sector actors that engage in innovation for societal needs.

Enabler-driven LLs are the type of LLs considered here since the case study examined in the paper is the Living Laboratories Initiative led by AAFC, a government department. The LLs within the Living Laboratories Initiative are agroecosystem LLs focusing on developing innovation for the public good, or “commoning”. The aim is to scale up and out agri-environmental BMPs to farmers across Canada to help fight climate change and other significant agri-environmental issues. Further conceptualization of the agroecosystem LLs identifies them as LLs aimed at sustainability and resilience in agri-food systems that have long, seasonal and unpredictable innovation cycles, involving a large multiplicity of partners, interests, and values which demand complex governance structures.

Agroecosystem LLs, compared with other LLs, have a number of complexities that imply unique management and implementation (McPhee, Bancarz, Mambrini-Doudet, Chrétien, Huyghe & Gracia-Garza 2021). As MCPhee et al (2021) note:

If including agroecosystem living labs in broader policy tool inventory of governments to tackle increasingly challenging and wicked policy issues within the agricultural and agri-food systems, public sector actors will therefore need to accept that these types of living labs may require more flexibility and intentional governance structures to balance complexities and number of changing users and partners involved.

For this reason, understanding and acting on the implications of the co-production process in agroecosystem LLs is important to identify impacts the governance structure and to encourage success.

Metagovernance

The state's continued prominence in today's policymaking processes is reflected in collaborative governance and collaborative innovation literatures as a lead coordinator or manager of multi-actor arrangements. Metagovernance is the 'governance of governance' (Jessop 2002, p. 240), a way in which to coordinate a governance system that cultivates fragmentation because of the diversity of actors and perspectives within it, as well as the amount of self-regulation involved (Sørensen 2006). Metagovernance is an important factor distinguished by many scholars studying collaborative processes (Ansell & Gash 2012; Gray 1989; Gray 2007; Pattberg & Widerberg 2016; Torfing 2016). The success of co-production as a collaborative policy tool will depend on metagovernance to provide a framework for effective action established in accountability (Howlett, Kekez & Poochareoen 2017). However, as Gray and Purdy (2018) note, a big challenge in government-led collaborations is managing power relations between participants, and ensuring that government does not dominate the collaborative process. This therefore becomes a delicate balancing act. Typically when the state takes on the role of *metagovernor*, it "combine[s], facilitate[s], shape[s] and direct[s] particular forms of governance in accordance with specific rules, procedures and standards embodying the hegemonic concept of what constitutes 'good governance'" (Sørensen & Torfing 2009, p. 246). Metagovernance can promote "efficiency, effectiveness, and democratic legitimacy" of these networks, while also ensuring a higher policy impact (Sørensen & Torfing 2017, p. 827).

Collaboration is based on an idea of "shared power" (Gray 1989). The idea of power in collaborative arrangements follows Gray and Purdy's (2018) conceptualization as something that affects social relations and determines actions. Government as metagovernor is able to even the playing field through their authoritative power by structuring the process in such a way that promotes collaboration, trust-building, and empowerment of every partner involved (Gray & Purdy 2018).

Many factors influence the outcomes and longer-term impact of collaborative arrangements. While many factors are important to a collaborative effort's success, scholars like Ansell and Gash (2008), Bancarz (2019), and Gray (2007) have noted that the collabora-

tive *process*, is a fundamentally significant factor in determining the outcomes of a collaborative arrangement. Therefore, designing an effective process will lead to greater success in an initiative. There are different aspects contributing to an effective collaborative process (i.e. starting conditions, structures, context, agency, etc.) (Bancercz 2019; Ansell and Gash 2008), however, given that the agroecosystem LLs discussed in this paper were relatively new initiatives at the data collection phase, this paper focuses on “starting conditions” to reflect their stage of operation examined at that moment.

Ansell and Gash (2008) introduce starting conditions as a collection of factors that can be understood as the “baggage” that is brought to the table by the collaborating partners. No one enters the collaborative network with a clean slate. These factors set up levels of trust, conflict, and social capital that can become opportunities or challenges when collaborating. Starting conditions are made up of three variables: asymmetries of power, resources, and knowledge; incentives for and constraints on participation; and prehistories of cooperation or conflict (Ansell & Gash 2008).

Asymmetries of power, resources, and knowledge are largely based under the umbrella of power imbalances which are well known challenges in collaborative initiatives (Brisbois & de Loë 2015; Choi & Robertson 2013; Gray 1989; Gray & Purdy 2018; Purdy 2012). These asymmetries relate to capacity, status, organization, resources for participation, and equal participation with other participants that can affect the strength of certain actors’ voices and actions in collaborative initiatives. This can also mean that some participants do not have the skills or expertise to participate in highly technical discussions, or that they do not have the time or liberties to participate in time-intensive collaborative processes. As a result of asymmetries, some participants may hold less ability to participate equally in collaborative arrangements. At this stage, they will not perceive the initiative as representative of their voices and views, losing commitment and trust, which endangers the collaborative process (Ansell & Gash 2008).

Ansell and Gash (2008) identify incentives for and constraints on participation as important to take into account since many collaborative initiatives are voluntary. The asymmetries discussed above also affect whether participants are not only willing to join a collaborative process, but also willing to continue engaging in it. An imbalance of power for example, can be an incentive for some to join the process, while a major deterrent for others. Incentives to participate will increase among participants if they perceive a direct relationship between their participation and the direction and outcomes of the collaborative process.

Lastly, prehistory of cooperation or conflict can affect or challenge collaboration. This however, can also be affected by a high level of interdependency that even considering a conflictual history among participants, may still lead toward effective collaboration. Generally a history of conflict will contribute to low levels of trust and commitment. Histories can also create subsets of cooperative participants that form cliques within the collaborative initiative which will harm the collaborative process (Ansell & Gash 2008).

Taking into account these conceptual discussions, this paper understands LLs as a policy tool of co-production embedded within a hybrid NPG context. Agroecosystem LLs, are considered as collaborative innovation policy tools being used in the public sector to

tackle complex agri-environmental issues with the participation of users (i.e. farmers) and other participants involved in these issues. Together, these participants share ownership of the innovation process within the public sector, becoming equally responsible for the results and impacts of the process. Innovation in this case, while can benefit the users (farmers), deals with climate change and agroecosystems which extend beyond participating farms. In addition, the agroecosystem LLs at AAFC are meant to also scale up and out innovations on farms, and for this reason, the benefits are societal and public. Ansell and Gash's (2008) starting conditions will be used to categorize data from the early days of collaboration in agroecosystem LLs in Canada.

METHODS

This was a qualitative exploratory case study design (Yin 2003). It looked at Canada's Living Laboratories Initiative made up of agroecosystem LLs as a case of collaborative innovation in the public sector. Canada's Living Laboratories Initiative's agroecosystem LLs were chosen as cases to examine because the author worked with the Living Laboratories Initiative in AAFC at the time of the study. Two sub-cases within the initiative were analyzed, the Atlantic agroecosystem LL and the Eastern Prairies agroecosystem LL. These sites were the focus of the study because they were the only ones that were running at the time of data collection. Though the differences between the agroecosystem LL sites were considered in the analysis, the purpose of the paper was not to compare both, but to use them to draw insights from the larger Living Laboratories Initiative. As such, this remained a within-case analysis (Onwuegbuzie & Leech 2007).

Participant observation was conducted in January 2020 over the course of two days when attending a co-development meeting in the Atlantic agroecosystem LL site¹. This participant observation was conducted not to collect data, but to design the data collection process by further identifying research participants, building rapport with potential interview participants, and observing co-development to assist with the formulation of interview questions. Notes were written by the researcher throughout the two days of co-development encompassing reactions and thoughts about relationships, body language, and general social cohesion of the group from observation and participation.

Participant observation was conducted as a hyphenated "insider-outsider" (Beals, Kidman & Funaki 2019; Humphrey 2007). My identity was positioned on the edges of both worlds as a government employee, indirectly working with the Living Laboratories Division, and a "neutral" academic researcher. I was both bound by Government of Canada rules of ethics and conduct, as well as by the academic conduct of both the Research Ethics Board at AAFC and my own understandings of an ethical and rigorous research process from my academic training. During participant observation, my hybrid identity not only defined how I approached the research, but also defined how research participants interacted with me. This dual identity was made transparent to research participants, but was not always understood or considered. Some research participants acknowledged my hybrid identity, but many saw me as either an insider (government employee), or an outsider

(academic researcher). These interactions differed based on how a given research participant understood my identity, and very likely, how I understood my own identity at a particular given point in time.

Data were drawn from a total of 34 semi-structured interviews² conducted between April and July 2020 through telephone or online video communication platforms. Interviews were conducted using intensity sampling to identify only those interview participants who directly participated in the Atlantic or Eastern Prairies agroecosystem LL sites. One representative from every organization directly involved in each LL site was selected to be interviewed, in addition to key informants among federal public servants, including scientists. Farmers were snowball sampled. A total of 40 interviews were planned, however, not all interviewees could be reached and not all interviews were able to be scheduled. Due to time constraints, interviews were concluded when I was not able to schedule any more interviews with the remaining participants.

This study was grounded in the observations, experiences, and meanings constructed by interview participants. Interview questions were broad to allow participants to construct their meanings of experiences or situations without imposition from the interviewer. While these interviews were conducted during the COVID-19 pandemic, it was clear that participants were able to distinguish experiences before the pandemic from those during, because they made separate comments about the challenges and obstacles specifically arising from the pandemic.

Ethics approval from AAFC's Human Research Ethics Committee was sought for the research. At the beginning of the study, it was agreed that names and where applicable, organization names, would not be attributed to data to maintain confidentiality. However, the type of interview participant in the data was important. To meet the study's confidentiality objectives as well as conduct meaningful analysis, the following table was constructed. It outlines the abbreviations that will be used for each interview throughout this study:

Table 1: Interview Participant Abbreviations

Type of Interview Participant	Abbreviation
Farmer	FAR 1-5
Federal public servant - AAFC management and implementation	AAFC-MI 1-7
Federal government scientist – AAFC	AAFC-SCI 1-3
Federal government scientist – other department	SCI 1-3
Non-governmental organization	NGO 1-12
Provincial public servant	PROV 1
Scientist from academia	ACA 1
Other partner	OTH 1-2

Interviews were transcribed and coded through two-cycle methods using qualitative data analysis software, MAXQDA.

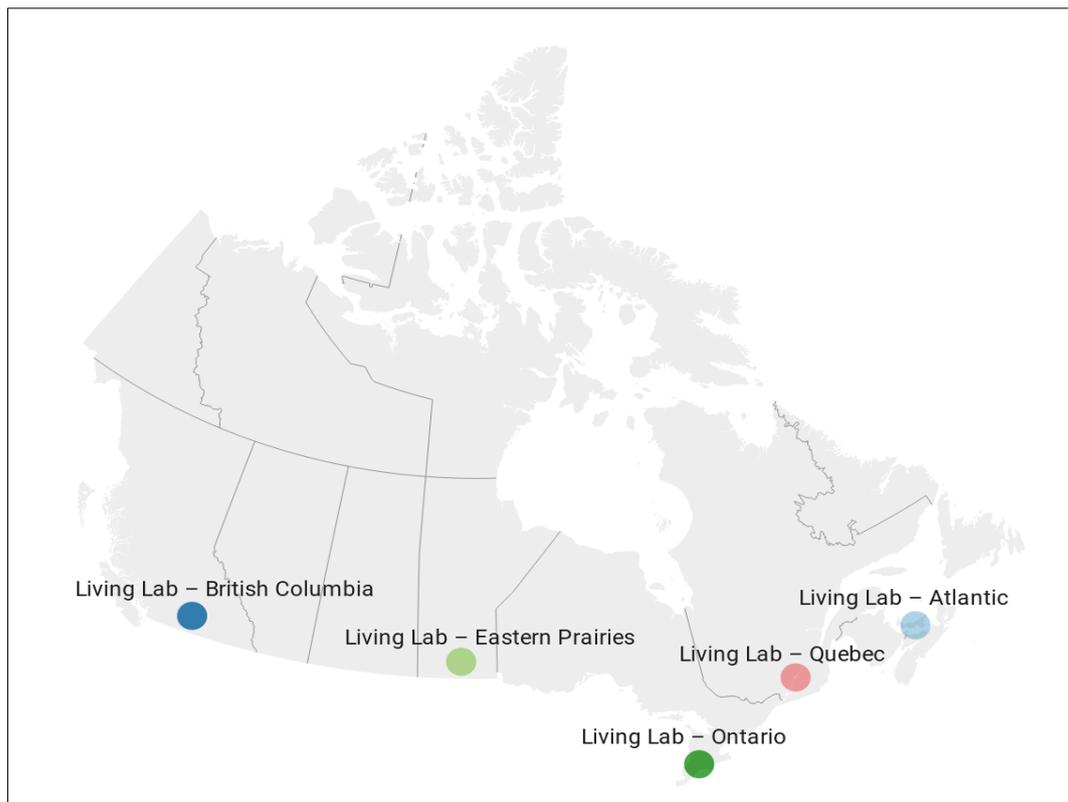
THE LIVING LABORATORIES INITIATIVE IN CANADA

The Canadian Living Laboratories Initiative was developed in 2018. It is led and funded by AAFC as a national network of agroecosystem LLs. There are five agroecosystem LL sites being implemented using a phased approach over the course of three years. The Atlantic and Eastern Prairies LLs were implemented in 2019, the Quebec and Ontario LLs in 2020/2021, and the British Columbia LL will be implemented at a later date. These dates have been delayed since the onset of COVID-19 in March 2020³. Figure 1 shows the approximate geographic locations of the sites.

AAFC developed the initiative in recognizing the urgent need for action on climate change, and as a way to accelerate the development and adoption of technologies and beneficial management practices on-farm. The Living Laboratories Initiative is a new approach within the Government of Canada, where AAFC is pioneering a collaborative innovation approach in agriculture within the federal government. It is coordinated and managed by the LLs Division in AAFC using an adaptive management approach which is a management method that supports flexibility in implementation, or “adapts” to the situation.

This paper focuses on the first two agroecosystem LL sites developed, the Atlantic and the Eastern Prairies. It is important to note that LL activities on these sites did not automatically commence at full-speed, and did not progress linearly or continuously, especially because funding did not begin flowing to the sites right away. In addition, the activities in the sites have slowed due to COVID-19, although Prince Edward Island and Manitoba, the provinces where the two LL sites studied were located, were not hard hit by the pandemic at that time. Restrictions varied between both sites over time as COVID-19 restrictions were largely mandated by provincial governments.

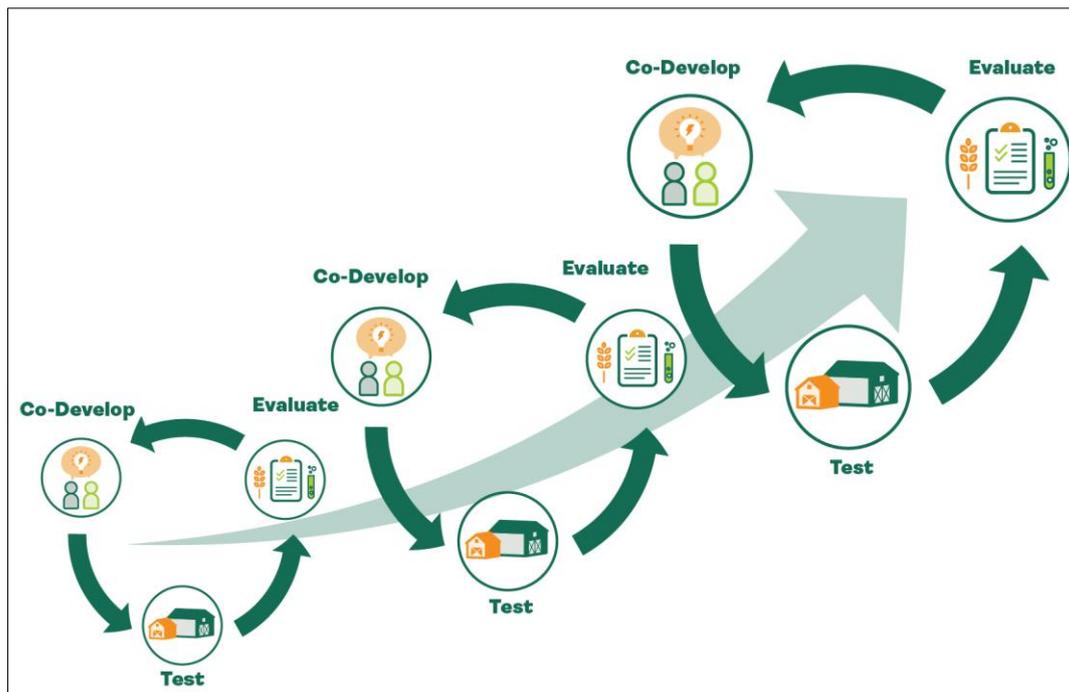
Figure 1: Five Initial Living Laboratory Sites Across Canada



Source: McPhee, C., M. Bancercz, M. Mambrini-Doudet, F. Chrétien, C. Huyghe, J. Gracia-Garza. 2021. "The Defining Characteristics of Living Labs." *Sustainability* 13(4): 1781. <https://doi.org/10.3390/su13041718>

The agroecosystem LLs focus on four major innovative purposes: adjusting to climate change, reducing water contamination, improving soil and water conservation, and maximizing habitat capacity and biodiversity on agricultural landscapes. BMPs relating to these priorities are developed on working farms of farmers participating in the LLs. Learning and adaptation occur after each phased implementation of an agroecosystem LL site, allowing every subsequent implementation of agroecosystem LLs in the initiative to be tweaked from the previous based on partners' feedback (AAFC, 2021a). Iteration is also a major focus. After every innovation cycle (see Figure 2) involves co-developing, testing, and evaluating. Teams leading scientific activities in each LL adjust the activities based on both the scientific and farmers' perspectives before entering a new innovation cycle (AAFC 2021a).

Figure 2: Innovation Cycle in the Living Laboratories Initiative



Source: Agriculture and Agri-Food Canada. 2021. About *the Living Laboratories Initiative*. Retrieved from <https://www.agr.gc.ca/eng/scientific-collaboration-and-research-in-agriculture/living-laboratories-initiative/about-the-living-laboratories-initiative/?id=1591731550143>.

Before identifying specific LL sites, engagement sessions with potential LL partners were held in areas around Canada where AAFC research centres existed. It was here that LLs were introduced as both an approach and method. Relevant research topics were co-developed with potential partners, in addition to identifying target regions where the LL scientific activities would take place as well as any additional partners that needed to be invited to the initiative (personal communication, NGO-1; AAFC-MI-3; AAFC-MI-4; AAFC-MI-7).

The agroecosystem LL sites are split into internal and external components, where the internal components house funding for internal partners (within the Canadian federal government), and the external components house funding for external partners (those outside the Canadian federal government). This funding structure was defined by the directives set out by the Treasury Board (personal communication, AAFC-MI-3) which is a central agency in the Government of Canada that assesses and approves spending by the federal government. Every LL site has a site coordinator housed in AAFC, and a lead internal and external partner. Parallel proposals outlining projects within each agroecosystem LL site were done along the internal and external groupings.

Internal partners include AAFC scientists, as well as other federal scientists. Generally, federal government scientists participating in LLs are responsible for the scientific activities occurring within the agroecosystem LLs, for building relationships with farmers and

some NGOs. Some AAFC scientists can also play a larger role in coordination and leadership in the LL sites and larger LL network. External partners are those partners outside of the Government of Canada including provincial governments, NGOs and other non-state organizations, academic scientists, and farmers. Provincial governments support coordination, relationship building between the Government of Canada and partners on the ground, as well as providing resources to other partners to facilitate their involvement in agroecosystem LLs. NGOs and other non-state organizations collaborate with scientists in various scientific activities, help foster relationships between scientists, government and farmers, and at times provide human capital to complete scientific activities including those on farm and socio-economic research. Some NGOs can also function as coordinators and leaders in a LL site. Academic scientists collaborate with other partners on scientific activities on farm as well as socio-economic activities with economists from AAFC. Lastly, farmers are considered the users in this initiative. They collaborate with every partner, especially scientists, to develop and adopt BMPs on their farms, as well as shape the broader initiative.

The Atlantic agroecosystem LL site is in Prince Edward Island in Eastern Canada, Canada's largest potato producer and smallest province. Its landscape is largely made up of a rolling topography and sandy loam soils with streams. High iron in soils gives Prince Edward Island's soil a red hue. The landscape suffers from increasing erosion and contamination from pesticides (AAFC 2021b).

Around 15 different BMPs are being explored in 41 different scientific activities on working farms stemming from the environmental issues identified in the province. These BMPs can be grouped into two major activities (AAFC 2021b):

1. Investigating nutrient flow and runoff management on farm fields, and implementing practices to enhance soil organic matter
2. Identifying and demonstrating farming practices for the quality and quantity of water

AAFC and other partners work with potato farmers, focusing specifically on BMPs relating to water and soil health in three different watersheds on the Island, Dunk River Watershed, Kensington North Watershed, and Souris Watershed. Around 75-85 participants are involved in this agroecosystem LL site (25 AAFC scientists, 7 other federal department scientists, 15 external partners, and over 30 potato farmers).

The following actors are involved in the Atlantic LL site in differing capacities:

Government

- AAFC public servants (including scientists)
- Public servants from other federal departments: Department of Oceans and Fisheries and Environment and Climate Change Canada (including scientists)
- Provincial departments: Prince Edward Island Department of Agriculture and Land

Non-governmental organizations

- East Prince Agri-Environment Association

- Prince Edward Island Potato Board
- Kensington North Watersheds Association
- Souris and Area Branch of the PEI Wildlife Federation
- Prince Edward Island Watershed Alliance
- Genesis Crop Systems Inc.
- Ducks Unlimited Canada

Academia

- Dalhousie University
- St. Francis Xavier University
- University of New Brunswick

Farmers

- Various largely in potato production

The Eastern Prairies agroecosystem LL site is located in the province of Manitoba in central Canada. It has a mixed landscape of prairie grasslands and forests. Agricultural production varies from cereals and canola to soybeans, corn, and potatoes. The province also maintains a large livestock production system (AAFC, 2021c). There are a number of environmental issues in this region identified by the provincial government including climate change, biodiversity, and sustainable land and water management issues (Manitoba Agriculture and Resource Development, n.d.).

The Eastern Prairies LL focuses on BMPs relating to climate change, water quality, soil health, and habitat conservation in four different watersheds. Research is conducted in four watersheds across the province: Upper Oak River, Swan Lake, North Shannon Creek and Main Drain. Some of these watersheds can be up to four hours away from each other by car.

Approximately 15 BMPs are being explored in 21 different scientific activities on farms. These can be grouped into four general activities (AAFC 2021c):

1. Investigating how perennial and cover crops can improve yield, livestock productivity, wildlife habitats (including pollinators), water quality, and carbon sequestration
2. Developing on-farm soil health and fertility indicators
3. Building knowledge and understanding around the relationship between fertilizer and landscapes to reduce nutrient loss and runoff
4. Identifying and demonstrating farming practices for the quality and quantity of water

Around 40-50 participants are involved in this agroecosystem LL site (15 AAFC scientists, 5 federal department scientists, 13 external partners, and over 10 farmers). The following actors are engaged in the Eastern Prairies LL site in differing capacities:

Government

- AAFC public servants (including scientists)
- Public servants from other federal departments, Environment and Climate Change Canada, and Fisheries and Oceans Canada (including scientists)
- Provincial departments, Manitoba Agriculture and Resource Development

Non-governmental organizations

- Assiniboine West Watershed District
- International Institute for Sustainable Development
- Keystone Agricultural Producers
- Manitoba Association of Watersheds
- Manitoba Forage & Grasslands Association
- Nature Conservancy of Canada
- Pembina Valley Conservation Watershed
- Redboine Watershed District
- Seine-Rat Roseau River Watershed
- Swan Lake First Nation

Farmers

- Various

RESULTS

This section presents results from the 34 interviews conducted. It is important to note that while these interviews took place within the first four months of the pandemic, participants were able to distinguish their experiences before and during the pandemic. In mid-March, most of Canada entered a lockdown for the pandemic, and all scientific activities in the LLs were at the time canceled. Both internal and external partners noted that not much work was being done at that time and there was an uncertainty as to whether any on-farm LL work would be completed in 2020. The growing season in Canada lasts only a few months requiring quick and careful preparation. Not being able to engage in LL scientific activities during the growing season would endanger the year for the agroecosystem LLs. Participants related these struggles to the provincial government restrictions in both sites, and not to the fundamental usefulness or effectiveness of LLs. Many partners also seemed overwhelmed, especially a few months into the pandemic, as many realized that working from home was going to last a lot longer than originally anticipated. For this reason, some interviews were not booked.

During interviews, most comments centred on how the agroecosystem LLs ran before the pandemic. Many interviewees discussed how things have manifested in the process of running the LL, grounding these experiences in what they brought to the table (their “baggage”) or the starting conditions (Ansell & Gash 2008). As such, the results are presented using the elements of the “starting conditions”: power-resource-knowledge asymmetries, incentives and constraints on participation, and the prehistory of cooperation or conflict.

It is acknowledged that asymmetries in resources and knowledge also lead to larger power asymmetries in collaborative arrangements.

The understanding of these asymmetries should also be grounded within the broader governing structure of the Government of Canada which can at times help or hinder program implementation. While some resulting obstacles are instituted out of necessity of accountability in bureaucracies, they can contribute to developing or compounding some asymmetries discussed below. Considering the palatability of LLs as an initiative within the current structures of government, an AAFC public servant noted,

I see it [the Living Laboratories Initiative] as perhaps unpalatable from the point of view of our rigid structures for measuring progress, from measuring productivity, for accountability purposes sometimes...that to me, is one of the biggest challenges that we have faced in the last year (personal communication, AAFC-MI-6).

Program design within government rules was identified by the AAFC public servant as one of the biggest challenges experienced (personal communication, AAFC-MI-6). These realities are therefore necessary to consider as important contextualization of these early results and observations from the LLs collaborative process.

Power-Resource-Knowledge Asymmetries

Discussions on power were identified in different topics throughout interviews where, at times, "power" was discussed directly, and at other times, indirectly. These instances provide insights into asymmetries in power relationships towards the beginning of the initiative.

"Power" was only explicitly mentioned twice, both by NGOs, with differing perspectives. One explained that farmers inherently have a lot of power in the agroecosystem LLs since work happens on farmers' fields only if they allow it (personal communication, NGO-1), reflecting the true nature of LLs as innovating with the user in real-life contexts. When asked about whether partners felt "heard" in the process, the majority of interview participants explained that they felt they could speak in meetings and that their ideas and comments were acknowledged. Discussing the initiative as a whole, one NGO participant suggested that external partners held less power than AAFC because they did not control funding and were dependent on AAFC to provide funding for scientific activities (personal communication, NGO-7). Along the same lines, a provincial public servant noted that,

It's [the initiative] probably as balanced as it can be, given that it still is a federal initiative. So, they're probably going to have the strongest voice since it's their money, their initiative (personal communication, PROV-1).

This brings to light an important point with regards to the public sector leading a LL network; even if partners feel heard in the initiative, at the end of the day, it is the government that holds the pen in terms of how the initiative is developed, how much and when funding is distributed for activities, and how long the initiative runs. In this case, it is AAFC that comes to the table with financial resources, while other partners mostly bring in-kind resources.

Resource discussions generally emphasized financial topics and capacity of partners to engage in LL processes. At times, as one AAFC public servant explained, these occurred because of funding delays resulting from the necessary bureaucratic processes within AAFC that were tied to approving the release of funding to external partners (personal communication, AAFC-MI-7).

Many resource asymmetries became apparent after participants discussed funding delays. As some explained, given the nature of the growing season, partners wanted to get started on their scientific activities as soon as possible in the spring. However, with a delay in the release of funds to external partners, many took on expenses without knowing whether or not they would be reimbursed (personal communication, NGO-2, OTH-10, NGO-6). Nonetheless, it was obvious that even with the delays impacting some partners' budgets, they were committed to getting the program running regardless. As one NGO partner explained, "every person at the table was willing to do whatever it took to make sure we didn't lose the spring...that we wouldn't lose the first year" (personal communication, NGO-2). At the same time, many external partners were waiting on the delayed approval of the LL site proposal and funding before starting any work or any engagements with producers which delayed their LL scientific activities (personal communication, AAFC-MI-1, NGO-5, NGO-6, SCI-1, NGO-7).

As one AAFC public servant explained, every LL site in the initiative contains a contribution agreement which lists projects and contributions required of internal and external partners, as well as guides for financial spending (personal communication, AAFC-MI-3). Resource asymmetries around finances became apparent when funding flows were delayed, and when some partners mentioned operational difficulties in their organizations after being given the responsibility to manage the cheque books on amounts much larger than accustomed to for several projects within their LL (personal communication, PROV-1, NGO-9). A couple of participants were concerned around the flexibility of funding allowed under the initiative, explaining that they had to purchase and pay for things to progress in projects that were not included in the contribution agreements, and did not know if those funds would be reimbursed, overstressing their organization's budget (personal communication, NGO-1, NGO-6, NGO-9). These financial experiences echo the statement by the provincial partner who noted that power remains with the federal government in this initiative because it ultimately owns the initiative and provides funding. Without funding, it was clear that many partners were apprehensive about collaborating and working on their own.

Another resource asymmetry discussed by partners was capacity, especially in terms of time. Some realized the amount of time participating in agroecosystem LLs required was much more than anticipated and questioned their continued ability to participate in a demanding collaborative process. One partner explained,

It's been challenging honestly, even before COVID hit. It feels like everyone's doing Living Labs off the side of their desk, and no one really has time to give a lot of attention and give it exactly the full attention that it seems to need (personal communication, NGO-9).

Time was raised as a significant factor which determined how partners engaged with agroecosystem LLs. Many external partners clarified that they were participating in the LLs as part of their jobs, but the responsibilities required were being done on top of their day jobs (personal communication, NGO-3, NGO-5, NGO-8, NGO-9). This is in contrast to federal public servants in AAFC who work as specialists in the Living Laboratories Initiative every day.

Scientists (some within and outside of AAFC) identified time commitment concerns as well. Scientists participating in LLs explained that they were expected to continue to conduct their regular scientific activities on top of those required in agroecosystem LLs (personal communication AAFC-SCI-2; AAFC-SCI-3). Two scientists noted that the amount of meetings and reporting needed to be done for agroecosystem LLs was much higher than in other projects (personal communication, AAFC-SCI-2, SCI-2). One scientist external to AAFC said that it was, "at times somewhat aggravating" (personal communication, SCI-2).

Time was especially a concern for farmers who were not able to drive out to in-person meetings, take the time to commit to multiple meetings, or engage in the expected process of the agroecosystem LLs (personal communication, AAFC-MI-1, NGO-3, AAFC-MI-3, OTH-10, FAR-3, FAR-5). One farmer suggested that they would be willing to commit extra time to the LLs projects, without receiving any financial assistance, if there was a clear benefit or payback down the road, believing that longer term benefits were more likely (personal communication, FAR-3).

An important thing to note is that many external partners who were not farmers tended to speak on behalf of them explaining that farmers had to be represented at meetings and throughout the agroecosystem LL process because they did not have the time to engage in many procedural aspects of LLs. One farmer noted that they really liked having representation at the meetings rather than going there themselves. The Prince Edward Island Potato Board was mentioned as a good representative for potato farmers in agroecosystem LL meetings (personal communication, NGO-2, FAR-4). However, at the same time, others preferred to be more directly involved in the initiative rather going through intermediaries such as the watershed groups to learn what was happening in the initiative.

Discussions around the lack of time to fully engage with LLs were also met with other conversations on networking and collaboration as key strengths of the initiative (personal communication, NGO-6; NGO-7; NGO-8; FAR-3), which seemed to contrast concerns around meetings since networking and collaboration often occurred in meetings.

The last asymmetry discussed is knowledge. While different types of knowledge exist, there were generally two knowledge asymmetries occurring in the initiative: between tacit knowledge (implicit knowledge based on intuition which is not easily identified or codified), and explicit (declarative knowledge that can be articulated and easily recorded to pass onto another) (Liyanage, Elhag, Ballal & Li 2009). One such asymmetry occurred between those who understood LLs and those who did not, and the other occurred between the knowledge of farmers and that of the scientific community.

The first knowledge asymmetry was represented through discussions on the need for more education and training for those involved in agroecosystem LLs. The LL approach is a

new way to engage with the federal government for the external partners, a new way for the federal government to operate in open innovation systems with both internal and external partners, a new way to do science for many scientists, as well as a new process to learn and navigate for others involved in the policy and programming side of agroecosystem LLs. While the engagement sessions occurring prior to the establishment of LLs discussed the LL approach and methodology, as did other co-development meetings, some interview participants admitted that they were still unsure how the agroecosystem LL process was supposed to work which may be hurting the potential of the initiative (personal communication, AAFC-SCI-2, NGO-9). It was apparent through discussions on engagement and integration of participants, that the feeling of a lack of training and knowledge about the functioning of agroecosystem LLs, and the uncertainty around the roles of different partners in initiatives affected the collaborative process in LLs. A couple of scientists noted that training in co-development was needed, as was training in the soft skills needed to participate in agroecosystem LLs (personal communication, AAFC-SCI-3, SCI-3). At the time of interviews, a few research participants admitted that their understanding of the vision of the Living Laboratories Initiative was blurry (personal communication, FAR-2, NGO-6, NGO-9), and others stated that LLs themselves were very complicated (personal communication, NGO-1; AAFC-MI-1; NGO-7; NGO-8). Some scientists felt that they were not prepared for the program, did not have a lot of time to think about what they were supposed to be doing with the funding provided and generally felt quite rushed. Other lab personnel were also unprepared for such a quick change in approach (personal communication, AAFC-SCI-2, AAFC-SCI-3).

One AAFC public servant confirmed this, noting that they needed more time to think through ways in which to integrate the many partners, especially given that this was a new approach and AAFC did not have the experience to contemplate methods of partner integration at the speed that agroecosystem LLs were unfolding (personal communication, AAFC-MI-7). In addition, there were no other LL implementations happening in the federal government, and thus no processes to learn from. Another federal public servant expressed the difficulty they were experiencing when encouraging scientists and external partners to think and engage with each other differently (personal communication, AAFC-MI-2). Some external partners were also concerned because they did not feel confident explaining this program to farmers (personal communication, NGO-8, NGO-9), and noticed that many scientists enlisted to co-develop scientific projects with farmers were also unsure of how to engage in co-development (personal communication, NGO-9). As one partner revealed,

I think the living labs concept is so complex and challenging to really understand - I honestly think it is - I love it but I still don't feel like I have a real grasp of it and it's so challenging to push through it and get to a point where we can get into a groove... (personal communication, NGO-9).

Nonetheless, it was noted by a federal public servant that being better at explaining what LLs are or "how to do LLs" is something AAFC was working on improving for the future development of agroecosystem LL sites (personal communication, AAFC-MI-7).

The second knowledge asymmetry was not as prominent in interviews but was nonetheless present. This was the asymmetry in explicit knowledge, in this case, scientific

knowledge of scientists and farmers' tacit knowledge. This point came up when discussing the technical language natural scientists used to communicate with farmers (personal communication, FAR-1), and other partners (personal communication, NGO-10; AAFC-SCI-3). One farmer recounted his conversations with other farmers in the interview; he explained that if someone did not have some background knowledge on soil chemistry and how that affected crops or the environment, it was at times difficult to understand how useful some of the science coming out of the LLs was for farmers (personal communication, FAR-1).

Incentives for and Constraints on Participation

The second element of starting conditions was incentives for and constraints on participation. This element revealed the drivers and intentions, or hesitations and risks experienced by partners participating in collaborative processes. Identified incentives to participate in the LLs largely focused on available resources, while identified constraints to participate were generally low.

There were four types of incentives identified by interview participants. The first and most often discussed incentive by interviewees was access to additional resources, whether this was stable funding (personal communication, NGO-2, OTH-1, NGO-9, NGO-11, OTH-2, NGO-12), data (personal communication, FAR-1, OTH-1, FAR-3, FAR-5), or additional people able to do research (personal communication, FAR-1, NGO-2, ACA-1). This resource incentive supports earlier discussions around asymmetries of resources and power in the previous section since additional resources were considered as fairly attractive incentives for some partners, showing that they were lacking them before. Second, participants discussed the environmental benefits coming out of agroecosystem LLs and admitted that many of them already aligned with the efforts of their organization or their personal efforts. Being a part of an initiative like agroecosystem LLs that moves the needle forward on agri-environmental issues was seen as positive (personal communication, NGO-1, NGO-8, NGO-9, NGO-12, FAR-3), where one interviewee noted, "it's nice to be at that place where you're part of that change" (personal communication, NGO-8). Third were the benefits of networking with other partners involved in the agroecosystem LLs. At times these were new relationships, and at other times they were opportunities to strengthen existing relationships, especially with farmers (personal communication, NGO-6, NGO-12, FAR-4). Fourth, was the opportunity to work directly with scientists, which external partners were usually not able to do (personal communication, NGO-2, FAR-1, FAR-4). While discussing farmers' participation, a NGO partner explained that farmers did not have the time to attempt to educate themselves about "ecological farming", and so having access to researchers and resources was very valuable (personal communication, NGO-3).

Generally, the risks of participating in agroecosystem LLs were deemed low by external partners (personal communication, NGO-10, NGO-7, NGO-8, NGO-9, NGO-11, OTH-2, FAR-5). The most mentioned potential risks had to do with finances: the rigidity of the federal government purse for a flexible initiative (personal communication, NGO-6), and organizational budgets that would have to be used for LL resources before submitting

expenses (personal communication, NGO-8, NGO-9, NGO-10). Nonetheless, all of these risks were deemed potential and low.

Federal government scientists, specifically those working in AAFC, identified constraints on their participation stemming from the change in research environment. AAFC scientists usually conduct research on research farms or in laboratories. In LLs, their scientific activities occurred on working farms with uncontrollable variables. A couple of scientists noted that the scientific activities occurring on farms in LLs did not lend themselves well to academic publications because of the inability to perform the scientific method on-farm (personal communication, AAFC-SCI-1; AAFC-SCI-2). One scientist explained their concern around job performance given that they are expected to publish papers to be promoted within AAFC (personal communication, AAFC-SCI-2). Others confirmed this performance difficulty (personal communication, AAFC-MI-1; SCI-2; SCI-3), but one scientist disagreed and noted that this challenge may differ based on discipline (personal communication, SCI-1). More generally, AAFC scientists explained the challenges of juggling their agroecosystem LL responsibilities and their day-to-day scientific activities (personal communication, AAFC-SCI-2; SCI-1), while not being clear about the connection between both (personal communication, AAFC-SCI-2; SCI-1). However, every scientist I interviewed saw the value in agroecosystem LLs which allowed them to conduct research with farmers having tangible, real-world and real-time impact.

Prehistory of Cooperation or Conflict

The last element of starting conditions, prehistory of cooperation or conflict, yielded insights around the kind of history or understanding of partners that participating actors brought to agroecosystem LLs through examining relationships.

Relationships were discussed by many interviewees. Some admitted that there was historical tension between environmental groups and farmers because perceptions tended to emphasize the extreme in both cases (i.e. farmers are not good environmental stewards and environmentalists do not understand agriculture and the realities of farming) (personal communication, NGO-5). There was also a brief discussion around some tension between farmers, those pushing for climate change mitigation using more drastic methods and those wanting to continue business as usual (personal communication, NGO-1, FAR-2), which was at times also generational (personal communication, FAR-1; FAR-3). These tensions could signal not only value conflicts, but also knowledge differences.

In terms of cooperation, the agroecosystem LLs built a foundation on many established relationships (personal communication, NGO-3, NGO-4). Several partners claimed that they already had well-established relationships with other partners in the LLs (personal communication, AAFC-MI-2, AAFC-SCI-1, NGO-4, OTH-1, NGO-6, NGO-8, NGO-10, NGO-11, OTH-2) or with some scientists (personal communication, NGO-5, NGO-8, NGO-12, FAR-4). Few partners pointed to the development of new relationships, though one mentioned a new relationship with a First Nation community (personal communication, NGO-8), another cited new relationships with particular farmers (personal communication, OTH-2), and yet another identified developing relationships with scientists (personal communication, FAR-3). The opportunities to network and strengthen relationships

through agroecosystem LLs were appreciated by many (personal communication, AAFC-SCI-2; NGO-8; NGO-11). One NGO partner explained,

we're building this community of practice, we all talk to each other and not as much as we should, and this actually gets us working together. It's one thing to make a connection at a conference or at a workshop or a meeting - that's happening in the province here - but to actually be working together to develop something, put it out there and to make sure it's running continuously, it builds that trust or builds a better perception amongst us and down to the producer level too - to know that we're all involved on the same team here (personal communication, NGO-6).

Some partners stated that this was an opportunity to get to know those working in the federal government, individuals they were not used to interacting with directly (personal communication, NGO-6; NGO-11; OTH-1). Others explicitly noted the lack of a relationship with policymakers in Ottawa and a general disinterest in building that relationship (personal communication, NGO-4, OTH-1). Historically, the relationship between some partners, namely farmers, and the federal government had room for further improvement (personal communication, FAR-1; FAR-2; FAR-3; FAR-4), and this is also notable to consider in terms of government-farmer interactions in the agroecosystem LLs.

DISCUSSION

Agroecosystem LLs as collaborative innovation approaches are new for both AAFC (scientist and policy/programming public servants) and the external partners involved. For this reason, it was evident from interviews that everyone was learning as they were doing and dealing with novel ways of working and thinking. It is important to acknowledge that there are unique challenges associated with developing an initiative like LLs as a model of open innovation with no precedence in the Government of Canada. The government processes and structures within which the Living Laboratories Initiative exists were not created for nimble and flexible open innovation initiatives. The initiative was functioning within the bureaucratic system that is often very rigid and ultimately limits the desired flexibility of the LLs. For example, this includes strict parameters as to how funding is distributed and controlled, and at times, lengthy approval processes for different aspects of the initiative. Numerous accountability measures and funding controls are in place, and it quickly became clear throughout my research that NPG was not the only public management system involved. Agroecosystem LLs are embedded in a hybrid model of management systems that at times can stifle innovative ideas simply because they do not fit into the rigid boxes of the way government functions. For this reason, the public sector as a lead coordinator or "enabler" of LLs can be challenging.

However, the public sector as the enabler of the agroecosystem LL is also advantageous. Government acts as a good convenor, bringing together various actors to the table as well as stable financing to the collaborative initiative. This enables external partners stable access to appropriate financial resources, without which they may not have been able to participate. Public servants within the system can also make a difference. Most recently, resulting from this research as well as the lived experiences of public servants involved in the LLs, some rigid bureaucratic aspects have become more malleable to support the

program's goals and foster stronger collaboration. For example, the interval versus external structure is being eliminated in the next iteration of the program, as is the language of "internal" and "external" partners. While this was a bureaucratic requirement to have both internal and external parties identified separately, bringing them under one umbrella eliminates the "us versus them" mind-set and fosters better collaboration and co-production opportunities.

The two agroecosystem LLs examined are still in their early functioning stages, and so interviewees were reflecting on their first experiences in the research interviews. While the innovation focus in agroecosystem LLs is centred on the science of BMPs, it became apparent through interviews that a major innovation in agroecosystem LLs was the co-production of scientific projects for the public good with external partners (especially farmers) in a different capacity. In other words, the social (collaboration) side of LLs or what Torfing (2016) calls "governance innovation". Though important and innovative agri-environmental scientific activities were co-produced on working fields with farmers and other non-state actors, there was also innovation developing through the advancement of a co-production tool like the agroecosystem LL intended to stimulate collaboration towards common goals among multiple actors.

Process skills have to be developed between partners to ensure fruitful collaboration (Gray 2007), and more awareness is needed with partners who are inexperienced in collaborative processes or unsure of their roles in them (Torfing 2016). Nonetheless, the continued confusion towards the LL approach was not a surprising finding given that the initiative is new, and AAFC as well as internal and external partners are learning as they go. It is vital to note that the knowledge of the bureaucratic processes and structures within which the Living Laboratories Initiative is embedded is not common knowledge. While this point was not mentioned directly in interviews, it could also be compounding the "blurriness" and complexity of the initiative for those not involved on AAFC's side of management and implementation. Furthermore, there were some participants who disagreed on the speed of innovations relating to agri-environmental issues and climate change. This could stem from a differing understanding and knowledge of what the problem definition, end goals of the initiative, and general disagreement on what "innovation" means. Considering both the issues in power which include resource and knowledge asymmetries, in addition to issues surrounding training, knowledge about LL processes, and the need for continued communication around the vision of the initiative, there is space for greater leadership or metagoverning role for AAFC in the Living Laboratories Initiative. Convening all the participants under a common knowledge baseline for LL methodology and process, as well as for a common vision of where everyone participating wants to be in a few years (i.e. "visioning" from Gray [1989]) would be important. This could also help with identifying common long-term benefits for everyone prompting stronger commitment and perhaps willingness to attend meetings.

Capacity in terms of time is a complex topic for everyone involved in collaborative initiatives. Building trust among participants and identifying commonly understood definitions of problems as well as developing common benefits takes time and the work of every participant involved. While LLs use a particular methodology to achieve their de-

sired goals, there is room for some flexibility which could be used to mould the LL process into something that reflects co-production through the eyes of those outside of designing the program. Government as a clear leader of the program, has the ability to guide this, especially since the agroecosystem LL tackles complex and at times wicked policy issues. The federal government itself as the “enabler” (Leminen, Westerlund & Nyström 2012) in this agroecosystem LL enters the collaborative process with more resources and power, and in a position to “metagovern”.

Metagoverning is not meant to inhibit the self-regulatory nature of the multi-actor network, the state's metagoverning must be “subtle” and “indirect” (Sørensen & Torfing 2009, 246). Such metagoverning can be achieved through facilitative leadership (Ansell & Gash 2012), by guiding the process, partnerships, and values and opportunities in the LL towards an effective process in collaborative problem-solving and innovation. The strong partnerships and already developed or developing trust as shown through the “pre-history of cooperation or conflict” starting conditions show that there is already a considerable amount of positive social capital and generally low level of conflict in the existing network. This can be advantageous when a higher level of metagovernance may be craved by partners. Nonetheless, it is also important to consider historical relationships between the government and farmers and how they can impact the uptake of agroecosystem LLs, the commitment levels of farmers, and the level of trust between the farmers as key users in the agroecosystem LL and with AAFC as the “enabler” (Leminen, Westerlund & Nyström's 2012). Taking notice of process dynamics becomes fundamental to successful partnerships (Gray 2007).

Steps are being taken within AAFC to learn more about process dynamics and how to improve upon the collaborative process. Given that AAFC is using an adaptive management approach to implementing agroecosystem LLs, there have already been lessons learned and applied. Some change stemmed from the first wave of agroecosystem LL implementations in the Atlantic agroecosystem LL and the Eastern Prairies agroecosystem LL to the second and third wave of agroecosystem LL implementations. In addition, AAFC continues to develop capacity in expertise in areas such as open innovation, and social science disciplines that complement the already existing strong economic capacity of AAFC. This allows different asymmetries within the LLs to be considered as the Living Laboratories Initiative matures. Lastly, emerging from this research, the LLs team has developed an informal action plan to address the challenges that were identified in this research, reflecting a commitment to the iterative process in LLs. Many of these are already being applied in the new version of the program being developed under the Agricultural Climate Solutions Program.

Finally, I come back to the research question identified at the beginning: How can LLs, especially agroecosystem LLs, help us understand more about the co-production processes between public and private actors? Agroecosystem LLs reveal that unsurprisingly, like many other multi-actor initiatives, collaborative processes are complex. Many partners within the process can struggle to find their place to engage in the process of co-production without clear and continuous guidance from a metagovernor. In earlier stages of collaborative processes, as in the case with agroecosystem LLs, starting conditions

may be particularly informative when considering the developing state of the collaborative process. Being aware of these conditions early is advantageous to a LL and its co-productive capacities because it provides insight into perceived strengths and challenges of a young initiative. By listening to partners, and each partner reflecting on their own roles and responsibilities in the co-productive process, an effective strategy forward towards deeper engagement of partners can be found through iteration.

The public sector, or AAFC in this case, was a particularly important actor because as the driver of the network and the one providing resources, it can hinder the collaborative process through bringing an unbalanced power relationship to the network of partners. At the same time, it can take stock of what is happening in the initiative, in the form of a “social iterative” process (such as this one) to learn how partners are engaging in the LL process, and whether something needs to be adjusted. This study is just one element of the social iterative process occurring in the initiative. However, while agroecosystem LLs are meant to empower the partners involved in the process (especially the farmers), it does not mean that processes such as these are devoid of power (Gray 1989). When examining LLs as open innovation approaches in the public sector, Gascó (2017) contends that “the process matters more than obtaining specific innovation results” (p. 96). Ensuring that partners feel as though they understand the process and are able to co-produce and co-create value equally is important to maintain engagement commitments from partners.

Agroecosystem LLs are a unique co-production tool however, they can have steep learning curves for everyone involved. Participants must learn about what LLs and the LL processes are, understand the complexities involved in the agroecosystem and be willing to be at the mercy of nature in order to progress scientific activities on-farm, as well as the complexities found in bureaucratic procedures. Public sector metagovernors are important because they bring a sense of funding stability for bigger programs (at least for a few years) and are able to envision these initiatives as long-term. As long as the program runs, it also has human resource capacity in government to continue supporting it, while other non-state actors may not have that resource capacity privilege. Agroecosystem LLs have shown us that co-production led by the public sector is a delicate process that requires constant attention and guidance to ensure that partners continue to trust the process and each other to follow a common goal.

CONCLUSIONS

This paper examined Canada’s LL Initiative as a collaborative innovation approach by looking at two agroecosystem LL sites to learn more about the beginnings of the collaborative process. Through semi-structured interviews and some participant observation, it explored participants’ experiences in the early stages of agroecosystem LLs.

Through this, my research found that in these early stages, starting conditions could be good indicators of early lessons in a collaborative process. In this particular case, some power asymmetries stemming from confusion around the way agroecosystem LLs function, and resource imbalances created obstacles for effective collaborative processes in

agroecosystem LLs in the future. The leadership of AAFC at this stage becomes particularly important, where metagovernance is essential to the agroecosystem LLs success. One advantage with collaborative processes like agroecosystem LLs is that iteration is a fundamental methodological piece in the process. Agroecosystem LLs provide us with a good co-production model to use as a map in collaborative processes meant to foster public good when solving complex and at times wicked policy problems having to do with agriculture, climate change, and beyond.

This paper encouraged reflection on some key foundational factors influencing the collaborative process at the initial stages of LLs. Public policy and public administration literatures were used to better understand how co-production as a policy tool under NPG could be used through an increasingly popular collaboration innovation model of LLs, and how important metagovernors are in this process. There are three key lessons that emerge from these case studies for other public actors looking to implement co-production policy tools, like LLs. First, the role of government as metagovernor in state-led co-production processes is significant to maintain not only a common understanding of issues and goals, but also to better understand and define the collaborative process as an initiative unfolds. Second, the role of power balances whether real or perceived should be reflected on regularly among partners, but especially government who may unknowingly affect the way partners perceive the collaborative process and therefore how committed and trusting they are of its direction. Lastly, regular "social iteration" is vital to a healthy and sustainable collaborative process. Learning how to collaborate and innovate, and how to do better after each iteration is not only beneficial, it is expected in a LL. Collaboration is a developing process rather than a final state of organization (Gray 1989), and so after every iteration, partners can learn more about themselves, about each other, and how to better collaborate to innovate towards a shared goal.

Further research can examine the later stages of these agroecosystem LLs' implementation to see how after more time together, and with some key changes being conducted by the LL team, participants in the LLs perceive the process and their participation. Future studies can also find more cleavages between different types of enabler-driven LLs and how those differences may affect implementation and continued functioning of the co-productive process.

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NOTES

¹ Attendance to the Eastern Prairies co-development meeting was also part of the research design, however, it was not possible at the time because of COVID-19.

² This included a total of seven research participants from AAFC's management and implementation, six federal government scientists (internal partners), 16 non-governmental organizations (external partners), five farmers, one provincial public servant, and one academic.

³ In April 2021, Nature Smart Climate Solutions Fund was announced as a broader Canadian climate change policy action. AAFC is the lead on one aspect of the fund relating to agri-environment issues, entitled the Agriculture Climate Solutions Fund. This \$185 million, 10-year program will be used by AAFC to broaden the LL model into other provinces in Canada focusing on sustainable and healthy agricultural systems (AAFC, 2021d).

REFERENCES

- AAFC. 2018. "Agroecosystem Living Labs: An Approach to Accelerate the Development and Adoption of Beneficial Management Practices." MACS-G20 [website]. https://www.macsg20.org/fileadmin/macsg20/MACS_Members/Argentina_Canada_Gray_Living-Lab_G20Argentina2018.pdf.
- AAFC. 2021a. "Living Laboratories Initiative." Government of Canada [website]. <https://www.agr.gc.ca/eng/scientific-collaboration-and-research-in-agriculture/living-laboratories-initiative/?id=1551383721157>.
- AAFC. 2021b. "Living Lab – Atlantic." Government of Canada [website]. <https://www.agr.gc.ca/eng/scientific-collaboration-and-research-in-agriculture/living-laboratories-initiative/living-lab-atlantic/?id=1610637569102>.
- AAFC. 2021c. "Living Lab – Eastern Prairies." Government of Canada [website]. <https://www.agr.gc.ca/eng/scientific-collaboration-and-research-in-agriculture/living-laboratories-initiative/living-lab-eastern-prairies/?id=1610637600747>.
- AAFC. 2021d. "Agricultural Climate Solutions." Government of Canada [website]. <https://www.canada.ca/en/agriculture-agri-food/news/2021/03/backgrounder-agricultural-climate-solutions.html>.
- Agger, A. and D.H. Lund. 2017. "Collaborative Innovation in the Public Sector – New Perspectives on the Role of Citizens." *Scandinavian Journal of Public Administration* 21(3), 17-37.
- Ansell, C. and A. Gash. 2008. "Collaborative Governance in Theory and Practice." *Journal of Public Administration Research and Theory* 18(4), 543–571. <https://doi.org/10.1093/jopart/mum032>.
- Ansell, C. and A. Gash. 2012. "Stewards, Mediators, and Catalysts: Toward a Model of Collaborative Leadership." *The Innovation Journal: The Public Sector Innovation Journal* 17(1), 1–21. http://innovation.cc/scholarly-style/2012_17_1_7_ansell_gash_innovate-leadrship.pdf.

- Bancerz, M. 2019. "Lessons from Developing Food Policy Through a Multistakeholder Governance Network: A Case of the Canadian Food Strategy." PhD diss. Ryerson University.
- Beals, F., Kidman, J. and H. Funaki. (2020). "Insider and Outsider Research: Negotiating Self at the Edge of the Emic/Etic Divide." *Qualitative Inquiry* 26(6), 593–601. <https://doi.org/10.1177/1077800419843950>
- Bekkers, V., Edelenbos, J. and B. Steijn. (2011). "Linking Innovation to the Public Sector: Contexts, Concepts and Challenges." In V. Bekkers, J. Edelenbos and B. Steijn (Eds.). *Innovation in the Public Sector* (pp. 3-32). New York, NY: Palgrave Macmillan.
- Bekkers, V. and L. Tummers. 2018. "Innovation in the Public Sector: Towards an Open and Collaborative Approach (pp. 3-32)." *International Review of Administrative Sciences* 84(2), 209-213. <https://doi.org/10.1177/0020852318761797>.
- Bommert, B. (2010). Collaborative Innovation in the Public Sector. *International Public Management Review* 11(1), 15-33.
- Brisbois, M.C. and R.C. de Loë. 2015. "Power in Collaborative Approaches to Governance for Water: A Systematic Review." *Society & Natural Resources* 29(7), 1-16. <https://doi.org/10.1080/14494035.2018.1521676>.
- Chesbrough, H. W. 2003. "The era of open innovation." *MIT Sloan Management Review* 44(3), 35–41. <https://sloanreview.mit.edu/article/the-era-of-open-innovation/>.
- Choi, T. and P.J. Robertson. 2013. "Deliberation and Decision in Collaborative Governance: A Simulation of Approaches to Mitigate Power Imbalance." *JPART* 24(2), 495-518. <https://doi.org/10.1093/jopart/mut003>.
- Crosby, B.C., Hart, P.'T. and J. Torfing. 2017. "Public Value Creation Through Collaborative Innovation." *Public Management Review* 19(5), 655-669. <https://doi.org/10.1080/14719037.2016.1192165>
- Daviter, F. 2017. "Coping, Taming or Solving: Alternative Approaches to the Governance of Wicked Problems." *Policy Studies* 38(6), 571–588. <https://doi.org/10.1080/01442872.2017.1384543>.
- Dekker, R., J. F. Contreras and A. Meijer. 2019. "The Living Lab as a Methodology for Public Administration Research: A Systematic Literature Review of its Applications in the Social Sciences." *International Journal of Public Administration* 43(14), 1207-1217. DOI: 10.1080/01900692.2019.1668410.
- Dentoni, D., V. Bitzer and G. Schouten. 2018. "Harnessing Wicked Problems in Multi-stakeholder Partnerships." *Journal of Business Ethics* 150(2), 333–356. <https://doi.org/10.1007/s10551-018-3858-6>.
- Dickinson, H. 2016. "From New Public Management to New Public Governance: The Implications for a 'New Public Service'" In J. Butcher and D. Gilchrist (Eds.). *The Three Sector Solution Delivering Public Policy In Collaboration With Not-For-*

- Profits and Business* (pp. 41-60). Australia: ANU Press. <https://doi.org/10.22459/TSS.07.2016>.
- Emerson, K., T. Nabatchi and S. Balogh. 2011. "An Integrative Framework for Collaborative Governance." *Journal of Public Administration Research and Theory* 22(1), 1–29. <https://doi.org/10.1093/jopart/mur011>.
- ENoLL. 2020. "Frequently Asked Questions: What are Living Labs? European Network of Living Labs." ENoLL [website]. <https://enoll.org/about-us/>.
- European Commission. n.d.. "European R&I Partnership on Agroecology Living Labs and Research Infrastructures." European Commission [website]. https://ec.europa.eu/info/research-and-innovation/research-area/agriculture-forestry-and-rural-areas/partnership-agroecology_en.
- Felin, T. and T. R. Zenger. 2014. "Closed for Open Innovation? Problem Solving and the Governance Choice." *Research Policy* 43(5), 914–925. DOI: 10.1016/j.respol.2013.09.006
- Garcia Guzman, J., H. Schaffers, V. Bilicki, C. Merz and M. Valenzuela. 2008. "Living Labs Fostering Open Innovation and Rural Development: Methodology and Results," *Proceedings of the IEEE International Technology Management 2008 Conference (ICE)*, Lisbon, Portugal, June 23–28: 1–8.
- García-Llorente, M., I. Pérez-Ramírez, C. Sabán de la Portilla, C. Haro and A. Benito. 2019. "Agroecological Strategies for Reactivating the Agrarian Sector: The Case of Agrolab in Madrid." *Sustainability* 11(4), 1–19. <https://doi.org/10.3390/su11041181>.
- Gascó Hernández, M. 2017. "Living labs: Implementing Open Innovation in the Public Sector." *Government Information Quarterly* 34(1), 90–98. doi:10.1016/j.giq.2016.09.003.
- Gray, B. 1989. *Collaborating: Finding Common Ground for Multiparty Problems*. London, UK: Jossey-Bass Publishers.
- Gray, B. 2007. "The Process of Partnership Construction: Anticipating Obstacles and Enhancing the Likelihood of Successful Partnerships for Sustainable Development." In P. Glasbergen, F. Biermann and A.P.J. Mol (Eds.). *Partnerships, Governance and Sustainable Development: Reflections on Theory and Practice* (pp. 29-48). Northampton: MA: Edward Elgar Publishing Limited.
- Gray, B. and J. M. Purdy. 2018. *Collaborating for our Future: Multistakeholder Partnerships for Solving Complex Problems*. New York: Oxford University Press.
- Hardyman, W., Daunt, K.L. and M. Kitchener. 2015. "Value Co-Creation through Patient Engagement in Health Care: A Micro-Level Approach and Research Agenda. *Public Management Review* 17(1), 90-107. <https://doi.org/10.1080/14719037.2014.881539>.

- Hartley, J., Sørensen, E. and J. Torfing. 2013. "Collaborative Innovation: A Viable Alternative to Market Competition and Organizational Entrepreneurship." *Public Administration Review* 73(6), 821-830. DOI: 10.1111/puar.12136.
- Head, B. W. and J. Alford. 2015. "Wicked Problems: Implications for Public Policy and Management." *Administration & Society* 47(6), 711–739. <https://doi.org/10.1177/0095399713481601>
- Hossain, M., S. Leminen and M. Westerlund. 2019. "A Systematic Review of Living Lab Literature." *Journal of Cleaner Production* 213(10), 976–988. <https://doi.org/10.1016/j.jclepro.2018.12.257>
- Howlett, M., Kekez, A. and O-O Poocharoen. 2017. "Understanding Co-Production as a Policy Tool: Integrating New Public Governance and Comparative Policy Theory." *Journal of Comparative Policy Analysis: Research and Practice*, 19(5), 487-501, DOI: 10.1080/13876988.2017.1287445.
- Hughes, O. 2010. "Does Governance Exist?" In S.P. Osborne (Ed.). *The New Public Governance? Emerging Perspectives on the Theory and Practice of Public Governance* (pp. 72-86). New York, NY: Routledge.
- Humphrey, C. 2007. "Insider-outsider: Activating the hyphen." *Action Research* 5(1), 11-26.
- International Agroecosystem Living Laboratories Working Group. 2019. "Agroecosystem Living Laboratories." MACS-G20 [website]. https://www.macs-g20.org/fileadmin/macs/Annual_Meetings/2019_Japan/_Executive_Report.pdf.
- Jukić, T., P. Pevin, J. Benčina, M. Dečman and S. Vrbek. 2019. "Collaborative Innovation in Public Administration: Theoretical Background and Research Trends of Co-Production and Co-Creation." *Administrative Sciences* 9(90), 1–17. <https://doi.org/10.3390/admsci9040090>.
- Kooiman, J. (Ed.). 1993. *Modern Governance*. London, England: Sage.
- Leinen, S., M. Westerlund and A-G. Nyström. 2012. "Living Labs as Open-Innovation Networks." *Technology Innovation Management Review* September, 6–11. <http://doi.org/10.22215/timreview/602>.
- Liyanage, C., T. Elhag, T. Ballal, Q. Li. 2009. "Knowledge Communication and Translation – A Knowledge Transfer Model." *Journal of Knowledge Management* 13(3), 118–131. DOI: 10.1108/13673270910962914.
- MACS-G20. (n.d.). "About MACS." MACS-G20 [website]. <https://www.macs-g20.org/about-macs/>.
- MACS-G20. 2018. "G20 Argentina 2018, 7th Meeting of Agricultural Chief Scientists (MACS) Communiqué." MACS-G20 [website]. https://www.macs-g20.org/fileadmin/macs/Communiqués/MACSG20_2018_Final_Communique.pdf.
- Manitoba Agriculture and Resource Development. (n.d.) "Environment." Manitoba Agriculture and Resource Development [website]. <https://www.gov.mb.ca/agriculture/environment/index.html>.

- Masou, R. 2017. "Behind Managerial Reforms: the French Experience." *Public Money & Management* 37(7), 485-490. <https://doi.org/10.1080/09540962.2017.1372103>
- McPhee, C., Bancercz, M., Mambrini-Doudet, M., Chrétien, F., Huyghe, C. and J. Gracia-Garza. 2021. "The Defining Characteristics of Living Labs." *Sustainability* 13(4), 1781. <https://doi.org/10.3390/su13041718>
- Nambisan, S. 2008. "Transforming Government Through Collaborative Innovation." Florida Benchmarking Consortium [website]. <http://www.flbenchmark.org/vertical/Sites/%7B101652CD-38DF-4EBF-A75F-D340327A2266%7D/uploads/%7B617F2C4E-F339-4BA5-A09D-C41FC71D4D9E%7D.PDF>.
- Nesti, G. 2016. "Living Labs: A New Tool for Co-Production?" In A. Bisello, D. Vettorato, R. Stephens and P. Elisei (Eds.) *Smart and Sustainable Planning for Cities and Regions: Results of SSPCR 2015* (pp. 267-281). Switzerland: Springer International Publishing.
- Nesti, G. 2018. "Co-production for Innovation: The Urban Living Lab Experience." *Policy and Society* 37(3), 310–325. <https://doi.org/10.1080/14494035.2017.1374692>.
- Onwuegbuzie, A. J., N. L. Leech. 2007. "A Call for Qualitative Power Analyses." *Quality & Quantity* 41, 105–121. <https://doi.org/10.1007/s11135-005-1098-1>.
- Osborne, S.P. 2010. "The (New) Public Governance: a Suitable Case for Treatment?" In S.P. Osborne (Ed.). *The New Public Governance? Emerging Perspectives on the Theory and Practice of Public Governance* (pp. 1-16). New York, NY: Routledge.
- Pattberg, P. and O. Widerberg. 2016. "Transnational Multistakeholder Partnerships for Sustainable Development: Conditions for Success." *Ambio* 45, 42–51. <https://doi.org/10.1007/s13280-015-0684-2>.
- Pestoff, V. and Brandsen, T. 2010. "Public Governance and the Third Sector: Opportunities for Co-Production and Innovation?" In S.P. Osborne (Ed.). *The New Public Governance? Emerging Perspectives on the Theory and Practice of Public Governance* (pp. 223-236). New York, NY: Routledge.
- Peters, B. G. and J. Pierre. 1998. "Governance Without Government? Rethinking Public Administration." *Journal of Public Administration* 8(2), 223–243. <https://www.jstor.org/stable/1181557>.
- Pierre, J. and G. G. Peters. 2000. *Governance, Politics and the State*. New York, NY: St. Martin's Press, Inc.
- Plattner, M. F. 2013. "Reflections on 'Governance'." *Journal of Democracy* 24(4), 17–28.
- Probst, B. (2016). Both/and: Researcher as participant in qualitative inquiry. *Qualitative Research Journal* 16(2), 85-102. <http://dx.doi.org.ezproxy.lib.ryerson.ca/10.1108/QRJ-06-2015-0038>

- Purdy, J. M. 2012. "A Framework for Assessing Power in Collaborative Governance Processes." *Public Administration Review* 72(3), 409–417. <https://doi.org/10.1111/j.1540-6210.2011.02525.x>
- Rhodes, R. A. W. 1996. "The New Governance: Governing without Government." *Political Studies* XLIV, 652–667. <https://doi.org/10.1111/j.1467-9248.1996.tb01747.x>.
- Rittel, H. W. J., and M.M. Webber. 1973. "Dilemmas in a General Theory Of Planning." *Policy Sciences* 4(2), 155–169. <https://doi.org/10.1007/bf01405730>.
- Sørensen, E. 2006. "Metagovernance: The Changing Role of Politicians in Processes of Democratic Governance." *American Review of Public Administration* 36(1), 98–114. <https://doi.org/10.1177/0275074005282584>.
- Sørensen, E. and J. Torfing. 2009. "Making Governance Networks Effective and Democratic Through Metagovernance." *Public Administration* 87(2), 234–258. <https://doi.org/10.1111/j.1467-9299.2009.01753.x>.
- Sørensen, E. and J. Torfing. 2010. "Collaborative Innovation in the Public Sector: An Analytical Framework." *Working paper series: Studies in Collaborative Innovation. Working paper no. 1/2010*. <http://www.ruc.dk/institutter/isg/forskningen/centre-netvaerk-samarbejder/clips/workingpapers/>.
- Sørensen, E. and J. Torfing. 2011. "Enhancing Collaborative Innovation in the Public Sector." *Administration & Society* 43(8), 842–868. <https://doi.org/10.1177/0095399711418768>
- Sørensen, E. and J. Torfing. 2017. "Metagoverning Collaborative Innovation in Governance Networks." *The American Review of Public Administration* 47(7), 826–839. <https://doi.org/10.1177/0275074016643181>.
- Sørensen, E. and S.B. Waldorff. 2014. "Collaborative Policy Innovation: Problems and Potential." *The Innovation Journal: The Public Sector Innovation Journal* 19(3), 1–17.
- Sorrentino, M., Sicilia, M. and M. Howlett. 2018. "Understanding Co-Production as a New Public Governance Tool." *Policy and Society* 37(3), 277–293. DOI: 10.1080/14494035.2018.1521676
- Torfing, J. 2016. *Collaborative Innovation In The Public Sector*. Washington, DC: Georgetown University Press.
- Torfing, J. and P. Triantafillou. 2013. "What's in a Name? Grasping New Public Governance as a Political-Administrative System." *International Review of Public Administration* 18(2), 9–24. DOI: 10.1080/12294659.2013.10805250.
- Weber, G., Cabras, I. and L.G. Frahm. 2019. De-Privatisation and Remunicipalisation of Urban Services Through the Pendulum Swing: Evidence from Germany. *Journal of Cleaner Production*, 236(1), 117555, <https://doi.org/10.1016/j.jclepro.2019.07.030>.
- Wegrich, K. (2018). The Blind Spots of Collaborative Innovation. *Public Management Review* 21(1), 12–20. <https://doi.org/10.1080/14719037.2018.1433311>

- Westerlund, M. and S. Leminen. 2011. "Managing the Challenges of Becoming an Open Innovation Company: Experiences from Living Labs." *Technology Innovation Management Review* 1(1), 19–25 <http://doi.org/10.22215/timreview/489>.
- Yin, R. 2003. *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage Publications Inc.
- Zavratnik, V., A. Superina and E. Duh Stojmenova. 2019. "Living Labs for Rural Areas: Contextualization of Living Lab Frameworks, Concepts and Practices." *Sustainability* 11(14), 1–17. <https://doi.org/10.3390/su11143797>

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ISSN 1662-1387