Adopting Organic Agriculture in British Columbia as an Established Pathway to Regenerative Agriculture

by

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Committee Approval

The members of Yussuf Olalekan Adedeji's Thesis Committee certify that they have read the thesis Adopting Organic Agriculture in British Columbia as an Established Pathway to Regenerative Agriculture and recommend that it be accepted as fulfilling the thesis requirements for the Degree of Master of Arts in Environment and Management.

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Table of Contents

Contents

List of Tables

List of Figures

Abstract

Organic agriculture is increasingly touted as an ecologically superior farming method, and as such, a pathway towards regenerative agriculture. This study is situated in British Columbia, where demand for organic produce continues to grow, yet local adoption of organic agriculture remains limited. The gap between market demand and farmers' uptake raises questions about the conditions that shape organic adoption. Additionally, the study considers the significance of organic farming for regenerative agriculture with a specific focus on soil health and reduction of synthetic inputs. It also examined awareness and support systems for organic agriculture in British Columbia. A qualitative research design was applied, using the Diffusion of Innovations and Social-Ecological systems frameworks. Data was collected using semi-structured interviews with 10 conventional farmers, 10 certified organic farmers, and 10 affiliated professionals. Findings indicate that, despite high awareness of organic agriculture among conventional farmers, this awareness does not translate into adoption. Organic agriculture is also heavily dependent on an informal system of support rather than on formal institutional support. The institutional support is seen as limited and poorly focused on organic agriculture. This underscores the importance of implementing measures that actively support conventional farmers willing to adopt organic methods. Key strategies include strengthening organic-specific extension services and developing policies that reduce structural risks. Awareness-raising programs alone are not likely to achieve significant outcomes. This study, drawing on farmers' and agricultural professionals' perspectives, offers insights into the systemic conditions that could be implemented to encourage the adoption of organic agriculture in British Columbia.

1. Introduction

1.1 Background to the Study

The contemporary global food system is at a critical juncture (Myers et al., 2017). Industrialized agricultural practices, heavily reliant on agrochemicals (pesticides and fertilizers), irrigation and hybrid cultivars, have historically been championed for their capacity to enhance yields and ensure food security for a growing global population (Srinivasarao et al., 2024). While these methods have driven productivity gains, they have also contributed to substantial ecological degradation, including soil fertility depletion, water contamination, biodiversity loss, and climate change (Geiger et al., 2010; Tilman et al., 2002). These methods are part of an input-intensive production model that has engendered a cycle of dependency on agrochemicals, in which declining soil health necessitates ever-increasing chemical inputs to maintain productivity, thereby undermining long-term agroecosystem resilience (Cranfield et al., 2009). Moreover, profligate use of pesticides has been shown to exacerbate pest incidence through mechanisms such as pest resistance, destruction of natural enemies, and the emergence of secondary pest outbreaks (Pimentel, 2005; FAO, 2018).

To address these systemic issues, sustainable agriculture has emerged as a comprehensive approach that encompasses environmental, economic, and social integrity. In this context, regenerative agriculture has emerged as a proactive and restorative strategy to restore soil health, hydrological cycles, biodiversity, and the resilience of agroecosystems (Schreefel et al., 2020; Rhodes, 2017). It is increasingly recognized as a critical way forward to sustainable and resilient food systems.

Organic Agriculture provides a structured, established agronomic practice that emphasizes soil health, ecological resilience, and biodiversity enhancement, and eschews synthetic inputs; it is a path through which many regenerative agriculture objectives can be achieved. Organic agriculture is an established and tested ecological farming model that has a clear set of standards and certification systems (IFOAM, 2014; Altieri et al., 2017). While regenerative and organic agriculture are not synonymous, they share several principles and environmental goals, including ecological restoration and sustainable food production.

The Canadian agricultural context mirrors tensions in the global agricultural paradigm. Agriculture accounts for about 7% of GDP and employs hundreds of thousands of people (Statistics Canada, 2022). However, the adoption of organic practices remains marginal, accounting for only about 3.1% of total farmland nationally. The British Columbia agricultural context reflects these broader tensions particularly notably. The province has a diverse agricultural landscape, strong consumer demand for organic food, and a wider public reputation for environmental consciousness. Organic BC estimated the provincial organic food and beverage market at $508.1 million in 2020, with organic products accounting for 5.1% of total pre-packaged grocery sales in BC (Organic BC, 2022). At the same time, the adoption of organic agriculture remains limited compared with broader market interest and the sustainability discourse surrounding food systems in the province. The 2021 Census profile reported only 511 farms in British Columbia selling organic products (Government of British Columbia, 2021). This makes British Columbia a compelling context for examining why organic agriculture, despite its recognized ecological and regenerative relevance, remains under-adopted by farmers.

British Columbia's agricultural setting is also shaped by small- to medium-scale farms, ecologically sensitive production zones, high land costs, and diverse regional growing conditions. These features create both opportunities and challenges for the adoption of organic agriculture. Understanding adoption in this context, therefore, requires attention not only to individual farmers' motivations but also to the broader socio-ecological, economic, and institutional conditions within which those decisions are made.

1.2 Research Problem

While public awareness of the ecological and health impacts of synthetic fertilizers and pesticides is increasing, the rate of adoption of organic agriculture in British Columbia remains relatively low (BC Ministry of Agriculture, 2020). Organic agriculture offers a well-established alternative to conventional agriculture, rooted in regenerative principles and promoting ecological health, soil fertility, and resilience (IFOAM, 2014; Altieri *et al.*, 2017). However, the adoption of organic methods is often hindered by complex socio-economic and institutional barriers (Cranfield et al., 2009; Van der Ploeg et al., 2012). No studies have sought to ascertain and compare the perspectives of conventional and certified organic farmers in British Columbia on their motivations for using their respective production methods. Understanding these perspectives is needed to effectively craft policies and mechanisms that encourage and support farmers' wider adoption of organic agriculture as one approach to British Columbia’s regenerative agricultural aspiration. As such, this study aimed to answer these questions.

1. How do conventional farmers in British Columbia perceive and understand organic agriculture?

2. What are the primary barriers precluding the adoption of organic farming methods by conventional farmers?
3. What motivated organic farmers to adopt organic practices, and how do they regard the outcomes of their decision?
4. What challenges do organic farmers face in sustaining their practices, and how does institutional support (e.g., policies, education, and networks) influence their success?

1.3 Research Objectives

1. Assess conventional farmers' knowledge of organic agriculture and their perceptions of its viability as an alternative to conventional, input-intensive farming methods.
2. Identify the barriers preventing conventional farmers from adopting organic farming methods.
3. Explore the motivations and decision-making process of farmers who have adopted organic agriculture.
4. Examine the challenges organic farmers in British Columbia face in sustaining their practices, and evaluate how institutional support (e.g., policies, education, and networks) influences their success.

1.4 Theoretical Framework

This study is grounded in two theoretical frameworks: Rogers' (2003) Diffusion of Innovation theory, first published in 1962 and cited here in its fifth edition, and Ostrom's (2009) Socio-Ecological Systems framework.

The individual-level adoption process was analyzed using the Diffusion of Innovation conceptual framework, in which organic agriculture was considered the innovation. The analytical emphasis was on farmers' decisions, which depended on the perceived qualities of the innovation, including relative advantage, complexity, and compatibility with existing values. The model also outlines the sequential process of innovation adoption, from initial knowledge acquisition to final confirmation, thereby providing a micro-level view of the cognitive and social process of individual farmers.

The Socio-Ecological Systems approach provides a macro-level perspective, enabling analysis of the context in which farmers operate. It was used to explore relationships among resource systems (e.g., British Columbia's unique agroecological regions), governance systems (e.g., provincial policies and certification agencies), and actors (e.g., farmers and agencies). This method sheds light on the role of system-level processes in constraining or supporting individual adoption decisions, as explained by the Diffusion of Innovation theory. The framework integrates key components: resource systems, resource units, governance systems, actors, and their interactions. These components were used to analyze factors that hinder or facilitate the adoption of organic agriculture.

1.5 Definition of Terms

- **Conventional Agriculture**: A method of farming that is typically heavily dependent on synthetic fertilizers, pesticides, and mechanization to maximize yield.
- **Organic Agriculture**: A method of farming that does not allow the use of synthetic inputs and emphasizes natural processes, ecological balance, soil health, and biodiversity.
- **Regenerative Agriculture**: A holistic approach to farming that aims to restore and enhance soil health, biodiversity, and ecosystem function. It often incorporates practices like compost application, cover crops, and reduced tillage.

- **Sustainable Agriculture**: Farming practices that meet current food needs while preserving environmental quality and resources for future generations. It also embodies the notion of social equity and justice.
- **Transitioning Farmers**: They are farmers who have adopted organic farming practices but have yet to be certified.
- **Diffusion of Innovation (DOI) Theory**: A framework that seeks to explain how, why, and at what rate new ideas and technologies spread through cultures and social systems.
- **Socio-Ecological Systems (SES) Framework**: A model for examining complex interactions between ecological systems and human social systems in the management of natural resources.

1.6 Organization of the Thesis

This study is organized into five chapters. Chapter One presents the study context, research problem, research objectives, research questions, and the general research importance of BC adoption of organic agriculture. The chapter also outlines the relationship between organic and regenerative agriculture and justifies the study of organic agriculture adoption in the context of British Columbia.

Chapter Two reviews the relevant literature on organic agriculture, regenerative agriculture, sustainable agriculture, and the environmental impacts of conventional agricultural systems. The chapter also explores the context of organic farming in Canada and British Columbia, including the demand for organic products, certification processes, institutional support, and barriers to adoption. It also analyzes previous studies on farmers' adoption of organic agriculture, including barriers and drivers of adoption decisions.

Chapter Three describes the study's methodological and research designs, theoretical frameworks, participants, data collection process, ethical considerations, and the method for analyzing qualitative data. The chapter also addresses the researcher's positionality in the research process.

Chapter Four presents and discusses the study's findings. The chapter explores participants' awareness, perceptions, motivations, and experiences regarding the adoption of organic agriculture in British Columbia. The results were analyzed using the Diffusion of Innovations and Social-Ecological Systems approaches and were related to the literature on the adoption of organic agriculture and sustainability transitions.

Chapter Five concludes the thesis by summarizing the major findings, discussing the study's broader implications, outlining its limitations, and providing recommendations for policy, practice, and future research on the adoption of organic and regenerative agriculture in British Columbia.

2. Literature Review

2.1 History of Organic, Sustainable, and Regenerative Agriculture

The historical development of organic, sustainable and regenerative agriculture reflects a long-term struggle to reduce the adverse ecological and social impacts of industrialized agriculture. Its predecessors can be traced back to the early twentieth century, when scientists and farmers began to question the growing reliance on synthetic fertilizers and pesticides (Leu, 2020). One of the most important figures in this line of thinking was Sir Albert Howard, whose studies in India at the start of the 20th century focused on soil fertility, composting, and the importance of biological processes in maintaining agricultural productivity. His work, An Agricultural Testament (1940), became the most prominent text of the organic agriculture movement. In it, natural processes were promoted in managing soil health rather than synthetic inputs (Howard, 1940). During the same period, Rudolf Steiner proposed biodynamic agriculture in 1924, advocating a biological view of agriculture that saw the farm as a living being in the wider ecological context (Kirchmann et al., 2008).

The ideas of these early organic pioneers spread worldwide in the 1930s and 1940s. Lady Eve Balfour was instrumental in advancing organic agriculture by establishing the Haughley Experiment in 1939, the first long-term side-by-side trial of an organic and a conventional agricultural system. The results of this experiment were published in her classic book The Living Soil (1943), which contended that soil, plant, and human health were inseparable. Meanwhile, J. I. Rodale popularized the organic movement in North America through publications such as Pay Dirt (1945), Organic Front (1948), The Organic Method on the Farm (1949), and Organic Merry-Go-Round (1954), and research projects that promoted soil-based farming and minimal chemical use (Treadwell et al., 2003; Abbott, 2023). These activities led to the early institutionalization of organic agriculture through farmer organizations, research projects, and educational programmes.

Since the 1960s, broader environmental concerns have strengthened interest in alternative agricultural systems. Rising concerns about pesticide pollution, soil erosion, and biodiversity loss have sparked substantial discourse regarding ecological approaches to agriculture. During this time, international support systems for organic agriculture were established, such as the International Federation of Organic Agriculture Movements (IFOAM), founded in 1972, which helped formalize global principles and standards for organic farming (Leu, 2020). As the movement grew, organic agriculture gradually evolved from a loose set of farming practices into a comprehensive approach guided by ecological and sustainability principles. Today, organic agriculture is an internationally recognized, codified system of agriculture supported by certification standards, research centres, and expanding markets.

Sustainable and regenerative agriculture are concepts and agricultural approaches that have been developed more recently, reflecting a broad movement to improve the environmental, economic and social performance of food production systems. The emergence of sustainable agriculture became notable in the late twentieth century, when policymakers and researchers began to focus on developing farming systems that were productive while preserving natural resources and sustaining rural livelihoods. Based on these concepts, regenerative agriculture emerged to focus on repairing soil health, increasing biodiversity, and enhancing ecosystem resilience by diversifying crops, reducing tillage, and integrating crop-livestock systems (Newton et al., 2020). Though these agricultural paradigms were developed in different historical periods, they share common intellectual origins in early ecological criticism of industrial agriculture. For example, organic agriculture has, for decades, promoted farming principles now embraced by regenerative farming advocates, such as soil restoration, biological diversity, and ecological balance. This historical background provides an essential foundation for understanding modern discussions of organic farming as a viable means to achieve more regenerative, sustainable food systems.

2.2 Sustainable Agriculture

The Food and Agriculture Organization (FAO) defines sustainable agriculture as a system that "manages resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of the environment and conserving natural resources" (FAO, 2014, p.2). This definition encapsulates the tripartite pillars that underpin most conceptualizations of sustainability: environmental integrity, economic viability, and social equity (FAO, 2014). Unlike a prescriptive set of practices, sustainable agriculture is best understood as a guide for progress. Sustainability represents a commitment to balancing food production with the long-term health of ecosystems and communities (Garnett et al., 2013).

Environmental integrity involves practices that conserve and regenerate natural capital and support ecological function. Sustainable agriculture includes enhancing soil health through organic matter amendments and reduced tillage, protecting water quality by minimizing runoff and leaching, and preserving and enhancing on-farm biodiversity, as shown in Figure 2.1 (Hobbs et al., 2008). Economic viability ensures that farming remains a profitable livelihood, resilient to market fluctuations and climate shocks. This may involve diversifying income streams, adding value through processing, or reducing dependency on costly external inputs. Social equity focuses on fair labour practices, community well-being, food security, and the viability of rural livelihoods (Kremen et al., 2012).

Standard practices associated with sustainable agriculture include crop rotation and diversification to break pest cycles and improve soil fertility; integrated pest management (IPM), which uses ecological knowledge to minimize pesticide use; agroforestry, integrating trees into farming systems; and conservation tillage to reduce erosion (Garnett et al., 2013; Jose, 2009).

The term "sustainable" has faced criticism for its malleability and the potential for weak interpretation, in which marginal improvements to conventional systems are regarded as sufficient, thereby avoiding big, transformative changes in food-system power structures and paradigms (Gosnell et al., 2019). Despite this critique, the concept remains essential for setting broad goals, within which more specific and ambitious approaches, such as organic and regenerative agriculture, are operationalized.

Figure 2.1 *Sustainable Agriculture*

Source: (Aslam et al., 2022).

2.3 Regenerative Agriculture

Regenerative agriculture represents an evolution and intensification of the concept of sustainability. If sustainable agriculture aims to ‘do no harm’ or maintain natural capital, regenerative agriculture explicitly aims to ‘do good’ by actively restoring degraded ecosystems and improving them over time (Rhodes, 2017). It is a holistic, principles-based approach that treats the farm as an interconnected system and focuses on outcomes, particularly the regeneration of soil health, which is seen as the foundation for improving the water cycle, increasing biodiversity, and enhancing ecosystem services (Schreefel et al., 2020).

The regenerative agriculture concept is characterized by a suite of interlinked practices designed to mimic natural systems:

- Minimizing soil disturbance: Adopting no-till or reduced-till methods to protect soil structure and fungal networks.
- Maximizing soil cover: Using cover crops and mulches to protect soil from erosion, suppress weeds, and feed soil biology.
- Increasing biodiversity: Through practices such as polycultures, crop rotations, hedgerows and riparian buffers, and integrated livestock and crop production, all to create resilient agroecosystems.
- Fostering biological nutrient cycling: Reducing or eliminating synthetic fertilizers in favour of compost, manure, and leguminous cover crops that feed soil life (LaCanne & Lundgren, 2018).

A seminal study by LaCanne and Lundgren (2018) in the US Midwest found that ‘regenerative’ corn farms, which employed such practices, were 78% more profitable than neighbouring conventional farms due to lower input costs and comparable yields and also demonstrated significantly higher levels of soil organic matter and biodiversity. This underscores the potential for regenerative systems to align ecological and economic goals. However, a significant challenge for the movement is the lack of a unified regulatory definition or certification standard (unlike organic agriculture), leaving it vulnerable to co-option and 'greenwashing' by entities that make superficial adjustments (Newton et al., 2020; Giller et al., 2021).

2.4 Organic Agriculture

Organic agriculture is the most codified and globally recognized approach to ecologically sound farming (Reganold & Wachter, 2016). Defined by national and international standards (e.g., Canadian Organic Standards, IFOAM norms), organic agriculture consists of a set of permitted and prohibited substances and practices (IFOAM, 2014). At its core is the prohibition of synthetic fertilizers, pesticides, genetically modified organisms (GMOs), and antibiotics in livestock production. Instead, it mandates reliance on natural processes and biologically derived inputs, such as compost and manure for fertility, biological pest control, mechanical weed management, and crop rotation to maintain ecosystem health (IFOAM, 2014).

The organic certification process, while varying somewhat from jurisdiction to jurisdiction, ensures adherence to strict production methods and standards. Certified organic foods (raw or processed) can then be legally labelled as such to inform consumers. Organic labelling also creates a distinct market niche, often accompanied by price premiums. Decades of research have documented the benefits of organic agriculture production systems, particularly enhanced soil biological activity and structure, reduced pesticide residues in food and water, and greater on-farm biodiversity (Mäder et al., 2002). Meta-analyses consistently show that organic farming supports significantly higher species richness than conventional farming (Tuck et al., 2014). While debates continue regarding yield reduction, the evidence is clear that organic systems perform strongly on per-unit-area metrics of energy efficiency, nutrient cycling, and farmer profitability when premium prices are realized (Seufert & Ramankutty, 2017).

In the context of this study, organic agriculture is not an end in itself but a proven, established, and verifiable pathway to achieving regenerative outcomes. The standards and practices of organic farming directly contribute to soil regeneration, water conservation, and biodiversity enhancement, making it a tangible, market-integrated entry point to a regenerative paradigm (Gattinger et al., 2012). Rodale Institute (2014) further conceptualizes 'regenerative organic agriculture' as a climate-resilient system capable of restoring ecological integrity while being market-integrated. Thus, organic agriculture provides a tangible, operational entry point for advancing a broader regenerative agriculture paradigm.

2.5 Key Differences and Overlap

Understanding the distinctions and synergies between sustainable, regenerative, and organic agriculture is crucial. Sustainable agriculture is the broadest umbrella concept, focused on maintaining system viability across the three pillars of sustainability: social, ecological and economic. It is a goal-oriented, aspirational framework that can encompass a wide range of practices, including some that may still involve limited use of synthetic inputs under integrated management plans.

Regenerative agriculture shares sustainability goals but is more targeted in its ecological objectives. Its focus is overwhelmingly on ecological processes and outcomes, particularly those related to soil health. It is not concerned with a specific prohibited input (though it generally favours natural systems), but rather with the functional outcome of an improving agroecosystem that operates on ecological principles and continuous improvement. It generally lacks formal certification.

Organic agriculture is distinct in its regulatory, standards-based nature. It provides a clear, binary definition (certified [adhering to standards] or not) based on input prohibitions and accepted production standards. While its standards lead to regenerative outcomes such as improved soil health, its primary regulatory mechanism is (synthetic) input prohibition rather than an explicit mandate for measurable ecological improvement or outcomes. The key differences and overlaps between organic agriculture and regenerative agriculture are summarized in Table 2.1.

Table 2.1 *Key Differences and Overlaps*

Feature	**Organic Agriculture**	**Regenerative Agriculture (Broad Definition)**
Regulation	Highly codified (Standards & Certification)	Loosely defined (Principles & Outcomes)
Inputs	Synthetic inputs prohibited	Synthetic inputs are often permitted (e.g., herbicides for termination)
Weed Control	Mechanical tillage or manual labour	Herbicides or grazing
Primary Goal	Ecological balance, absence of synthetics	Soil health restoration, carbon sequestration

While regenerative and organic agriculture are two distinct concepts, there is a high degree of overlap, especially regarding soil health, biodiversity, ecological resilience, and reduced reliance on synthetic inputs (Schreefel et al., 2020; Altieri et al., 2017). Organic agriculture is defined by guidelines and standards, certified production methods, and a well-established history of production practices (IFOAM, 2014; Reganold & Wachter, 2016), and is more narrowly defined and regulated than regenerative agriculture (Giller et al., 2021; Newton et al., 2020). This means that organic agriculture may be seen as a viable option for achieving many of the objectives of regenerative agriculture. The study of the adoption of organic agriculture can therefore shed light on how the goals of regenerative agriculture can be better actualized on conventional farms.

The trend of growing interest in organic and regenerative agriculture is closely related to growing concerns about the environmental and human health impacts of conventional agriculture. The use of conventional agricultural methods has depended greatly on synthetic fertilizers and pesticides, both to increase productivity and to maintain stable crop production. These inputs have been very important in boosting agricultural production. However, there is growing evidence that their high and frequent use has been detrimental to soil quality, water quality, biodiversity, and broader public health and ecological issues (Tilman et al., 2002; Pingali, 2012). These worries have intensified the desire for alternative farming practices, such as organic and regenerative agriculture, that aim to minimize reliance on synthetic agrochemicals and foster ecological sustainability, soil health, and environmental resilience.

2.6 Effects of Agrochemicals

The expansion of agrochemical-dependent farming has had profound ecological and socio-economic consequences globally. Since the mid-20th century, synthetic fertilizers and pesticides have been central to conventional (industrial) agriculture, driven by the Green Revolution’s emphasis on maximizing yields. While these inputs have contributed to increased productivity, growing evidence highlights their long-term negative impacts on soil health, water systems, biodiversity, and human well-being (Pingali, 2012).

Agrochemicals broadly refer to chemical substances used in agriculture, including:

- Synthetic fertilizers (e.g., urea, ammonium nitrate): Supply essential plant nutrients such as nitrogen (N), phosphorus (P), and potassium (K).

Pesticides are agrochemicals specifically used to manage pests that harm crops. They include:

- Herbicides (e.g., glyphosate, atrazine, 2,4-D): control unwanted plants (weeds) that compete with crops for nutrients, water, sunlight, and space.
- Insecticides (e.g., chlorpyrifos, imidacloprid, cypermethrin, DDT): protect crops by targeting harmful insects that damage plants or spread disease.
- Fungicides (e.g., mancozeb, chlorothalonil, copper oxychloride): control fungal infections that affect plant health.
- Bactericides (e.g., streptomycin, copper sulphate): target bacterial pathogens.
- Miticides (e.g., abamectin, dicofol): manage harmful mites.

All are intended and used to enhance productivity by controlling pests and thereby promoting plant growth. However, their widespread and often indiscriminate use has generated substantial unintended consequences. (Tilman et al., 2002; Zhang et al., 2015).

2.6.1 Effect on Soil Health

Agrochemicals disrupt the soil's delicate living ecosystem. Synthetic nitrogenous fertilizers can inhibit microbial communities responsible for natural nitrogen fixation and organic matter decomposition, leading to a long-term decline in soil organic matter (SOM), which is key to fertility and structure (Khan et al., 2007). Herbicides such as glyphosate can negatively affect beneficial soil fungi, including mycorrhizae, which are crucial for nutrient and water uptake (Nguyen et al., 2016). Excessive nitrogen application causes soil acidification, locks up essential nutrients, and degrades fertility (Guo et al., 2010). The loss of organic matter and soil biota leads to soil compaction, reduced water infiltration, and increased erosion, creating a negative feedback loop and the need for ever more input.

2.6.2 Effect on Water Systems

Adverse impacts extend far beyond field boundaries. Soluble nitrate- and phosphate-based fertilizers leach into groundwater or are carried off-site via surface-water runoff, driving over-enrichment and eutrophication of water bodies. This leads to toxic algal blooms, oxygen depletion (‘dead zones’), and loss of aquatic biodiversity (Carpenter et al., 2008). In British Columbia, nitrate contamination in intensive agricultural areas, such as the Abbotsford Aquifer, remains a concern (Zebarth et al., 2015). Pesticides also contaminate waterways, with compounds like neonicotinoids posing risks to aquatic invertebrates (Morrissey et al., 2015).

2.6.3 Effect on Human Health

Human health impacts of synthetic agricultural inputs occur via two main pathways: dietary exposure and environmental exposure. Farmers and agricultural workers experience disproportionately high levels of occupational pesticide exposure, with substantial epidemiological evidence linking such exposure to elevated rates of certain cancers, particularly non-Hodgkin lymphoma, as well as neurological and respiratory disorders (Schinasi & Leon, 2014). Large cohort studies in the United States have documented cancer incidence patterns among pesticide applicators that exceed national averages for specific malignancies, highlighting the long-term health burden associated with conventional agrochemical use. Dietary exposure to low-level pesticide residues in food and contaminated drinking water (e.g., nitrates) poses broader public health concerns, including potential endocrine disruption and developmental issues in children (Ward et al., 2005).

The health expenditures associated with treating illnesses linked to agrochemical exposure represent a substantial externalized cost of conventional agricultural systems. These costs extend beyond acute pesticide poisoning, which results in millions of cases globally each year, to include chronic conditions such as non-Hodgkin lymphoma, Parkinson's disease, respiratory disorders, endocrine disruption, and developmental impairments (Schinasi & Leon, 2014). For example, Glyphosate (Bayer AG, Leverkusen, Germany), the most widely used herbicide worldwide, has recently been classified as a probable carcinogen (Zang et al., 2019).

In economic terms, these health impacts constitute negative externalities costs not borne by producers or reflected in the market price of agrochemicals, but instead transferred directly to public healthcare systems, workers, families, and society at large (Pretty et al., 2005). Empirical estimates suggest that when healthcare expenditures, productivity losses, and environmental remediation costs are accounted for, the societal costs of pesticide-intensive agriculture far exceed the private costs of chemical inputs (Pimentel, 2005). Consequently, conventional production systems may appear economically efficient only because substantial health-related expenses are externalized and absorbed by public institutions and vulnerable communities rather than internalized within the production model itself (Landrigan et al., 2018).

2.7 Comparative Overview of Effects Between Agrochemicals and Organic Farming

The contrast between conventional (agrochemical-based) and organic (biological-based) farming systems is stark across ecological and social dimensions. The following table (2.2) summarizes key comparative effects.

Table 2.2 *Comparative Effects of Agrochemical-Based and Organic Farming Systems*

Criteria	Conventional (Agrochemical-Based) Farming	Organic (Natural Input-Based) Farming
Soil Health	Degrades soil organic matter, acidifies soil, reduces microbial diversity and activity, and promotes soil compaction and erosion.	Builds soil organic matter; improves soil structure and aggregation; enhances microbial and fungal biodiversity; increases water infiltration and retention.
Water Quality	High risk of nitrate/phosphate leaching and runoff, causing eutrophication; pesticide contamination of surface and groundwater.	Significantly reduces nutrient leaching and runoff; minimal to zero synthetic pesticide contamination; improves soil water-holding capacity, reducing irrigation demand.
Biodiversity	Often reduces on-farm biodiversity through monocultures and pesticide use, harming non-target organisms, including pollinators and beneficial insects.	Supports significantly higher levels of on-farm biodiversity (flora and fauna); provides habitat for pollinators and natural pest predators.

Carbon Sequestration	Typically, a net source of (or minimal sink for) greenhouse gases due to fertilizer volatilization, soil carbon loss, and fossil fuel use.	Potential for significant net carbon sequestration in soils through the buildup of stable organic matter.
Human Health Exposure	Direct exposure risks for applicators; dietary exposure to pesticide residues; nitrate contamination in drinking water: dietary exposure risk, especially for children.	Eliminates risks from synthetic pesticide residues in food; protects farmworker health; eliminates nitrate pollution from synthetic fertilizers. Eliminates dietary exposure.
Input Dependency & Cost	High dependency on external synthetic inputs, tying farm economics to global fossil fuel and chemical markets and volatile costs.	Lowers long-term input costs by cycling on-farm nutrients; reduces exposure to volatile input markets; costs shift towards knowledge, labour, and management.
System Resilience	It is brittle; high yields depend on consistent access to inputs and a stable climate; degraded soils are less resilient to drought and extreme weather.	Enhanced resilience to climate stress due to healthier soils with better water retention; diversified systems buffer against pest outbreaks and market shocks.

Sources: Tilman et al. (2002); LaCanne & Lundgren (2018); Schreefel et al. (2020); Zhang et al. (2011).

2.8 Social, Ecological and Economic Benefits of Organic Farming

2.8.1 Ecological Benefits

The ecological benefits of organic farming are well documented. Organic systems consistently exhibit higher soil organic carbon levels, improved soil structure, and greater abundance and diversity of soil macro- and microfauna (Mäder et al., 2002). A 'living soil' is the driver of other benefits, such as enhanced water infiltration and retention, reduced irrigation needs and drought vulnerability, and increased carbon sequestration- mitigating climate change (Flint et al., 2018). On-farm biodiversity, including pollinators, avifauna, and useful arthropods, is generally 30-50% higher in organic agricultural systems than in conventional systems, thereby enhancing the broader landscape's ecological well-being (Tuck et al., 2014). Besides biodiversity, ecologically based agroecosystems can also enhance agrosystem resilience. A study of smallholder farms in Nicaragua revealed that enterprises that used agroecological systems, such as diversified planting, soil conservation structures, and organic matter management, had significantly less damage and recovered faster after Hurricane Mitch than conventionally managed farms (Holt-Gimenez, 2002). The findings imply that ecologically based farming systems have the potential to increase not only biodiversity but also the resilience of agricultural systems to environmental disturbances.

2.8.2 Economic Benefits

Economic benefits of organic agriculture can be significant, though context-dependent. While during transition (to full organic certification) periods (typically three years in British Columbia) farmers may see yield depression and incur certification costs, established organic farms often achieve profitability through two channels: 1) lower variable costs due to eliminated synthetic input purchases, and 2) price premiums in dedicated organic markets (Rodale Institute, 2014). LaCanne and Lundgren (2018) found that profit was driven primarily by lower costs rather than by premiums. Furthermore, organic systems can reduce financial risk by decoupling from volatile global input markets and building more resilient production systems that are less susceptible to climate and pest shocks.

2.8.3 Social Benefits

Social benefits are considered profound but less quantifiable. Organic farming often fosters greater farmer autonomy and agroecological knowledge, shifting the role from input purchaser to ecological manager (Kremen & Miles, 2012). It can strengthen local food systems and community ties through direct marketing channels such as farmers' markets and Community Supported Agriculture (CSA). However, these channels are not exclusive to organic farming and are also common among small-scale farms regardless of production method. These spaces provide organic farmers with opportunities to build closer relationships with consumers (Devlin, 2016; Hinrichs, 2000). In addition, organic farmers may serve as visible role models for other farmers through peer influence and social learning (Tran-Nam et al., 2022). Notably, the principles of organic farming align strongly with Indigenous ways of knowing and traditional ecological knowledge, which emphasize reciprocity with the land, long-term stewardship, and holistic management (Lowitt et al., 2019).

2.9 Organic Agriculture in Canada and British Columbia

Organic agriculture in Canada and British Columbia must be understood not only as a production system, but also as a growing sector shaped by market demand, certification structures, knowledge networks, and uneven support conditions. Existing literature suggests that the growth of organic agriculture depends on more than consumer demand alone. It also depends on whether farmers can access credible certification pathways, practical technical support, trusted knowledge systems, and institutional conditions that reduce the risks of transition and long-term practice (Knowler & Bradshaw, 2007; Prokopy et al., 2008). For this reason, the Canadian and British Columbian contexts are important to consider in understanding why organic agriculture remains both promising and difficult to expand in practice.

2.9.1 Market Growth, Demand, and Supply Gaps

The growth of organic agriculture in Canada over the last two decades has been significant, driven by rising consumer concern about food quality, health, environmental sustainability, and ecological production practices. Sector reports have consistently described Canada as one of the world's larger organic markets, with continued demand for organic fresh produce, dairy, grains, meat, and processed foods (Canada Organic Trade Association [COTA], 2023). More recent national reporting indicates that the Canadian organic market reached $9.75 billion in 2024, underscoring the continued growth of consumer demand (Organic Federation of Canada, 2025). At the same time, this market growth has not been matched by equivalent growth in domestic supply, and sector organizations continue to emphasize Canada's reliance on imports to meet consumer demand (COTA, 2023; Organic Federation of Canada, 2025).

This imbalance is also visible in official farm-level statistics. Statistics Canada reported that in 2021, 5,658 farms in Canada sold organic products, representing only 3.0% of all farms, an increase from 2016 (Statistics Canada, 2022). These figures suggest that, while the market for organic food continues to expand, farmer uptake remains relatively limited at the national level. As previous studies have shown, demand alone is often insufficient to drive adoption because transition to organic agriculture involves changes in management, labour, markets, and risk exposure that many farmers perceive as substantial (Knowler & Bradshaw, 2007; Padel, 2001).

The same tension is especially relevant in British Columbia. Organic BC's market report estimated the provincial organic food and beverage market at $508.1 million in 2020 and reported that organic products accounted for 5.1% of total pre-packaged grocery sales in BC, the highest provincial market share in Canada (Organic BC, 2022). However, the 2021 British Columbia agriculture profile reported only 511 farms in the province selling organic products, including 457 certified farms and 57 farms in transition (Government of British Columbia, 2021). This points to a continuing gap between strong consumer demand and the still-limited scale of local adoption and production.

2.9.2 Regulation, Certification, and Imports

Organic agriculture in Canada is regulated through a national certification framework centred on the Canada Organic Regime and the Canadian Organic Standards. Under the Safe Food for Canadians Regulations, any food, seed, or animal feed marketed as organic in interprovincial or international trade must comply with federal organic requirements. The Canadian Food Inspection Agency (CFIA) is responsible for monitoring and enforcing this framework (CFIA, 2024). Certification bodies accredited under the Canada Organic Regime inspect operators and certify products in accordance with national standards governing production, processing, labelling, and handling (CFIA, 2024). This system plays an important role in protecting the integrity of organic claims and maintaining consumer trust in organic products.

Imports are also a significant part of the Canadian organic sector. The CFIA states that imported organic products entering Canada must come either from countries with recognized equivalency arrangements or from operators certified by accredited certification bodies in accordance with Canadian requirements (CFIA, 2024). In practice, this means that imported products can legally enter the Canadian organic market while domestic production remains insufficient to meet demand. As a result, certification and regulation support consumer confidence, but they do not by themselves solve the problem of limited domestic production and adoption.

Previous research also suggests that certification can itself become part of the adoption challenge. Cranfield et al. (2010) argue that many farmers perceive certification as administratively burdensome, expensive, and time-consuming, especially during the conversion period. Similarly, Padel (2001) notes that inspections, record keeping, and compliance requirements can discourage adoption even where demand for organic products exists. These concerns are particularly important for small- and medium-scale producers, who may have fewer financial or institutional resources to absorb the costs and obligations of transition. The Canadian Organic Standards also permit split or partial certification under certain conditions. This means that a farm may contain both organic and non-organic production units, provided they are clearly separated and managed to prevent co-mingling and contamination, with the expectation that full transition should occur where feasible (Organic Federation of Canada, 2026). Such an arrangement can provide a more gradual route into organic certification, although previous Canadian research suggests that it is more likely to be feasible for larger farming operations than for smaller farms with more limited capacity to separate production systems (Khaledi et al., 2010)

2.9.3 Knowledge Networks, Extension, and Adoption Support

A growing body of research shows that knowledge systems, extension services, and social learning networks are important influences on the adoption of organic agriculture. Organic farming often requires context-specific ecological knowledge related to soil fertility, pest management, crop rotation, biodiversity, and long-term resilience. In this sense, successful adoption depends not only on farmers' interest but also on access to trusted, practical knowledge. Canadian research has highlighted the importance of mentorship, peer learning, and farmer-to-farmer exchange in helping producers build confidence in alternative farming practices (Laforge & McLachlan, 2018). Kroma (2006) similarly emphasizes the role of farmer networks in building trust, encouraging experimentation, and supporting learning-by-doing, particularly in areas where formal extension service programming is limited.

Extension services and technical support also remain important. Prokopy et al. (2008) found that farmers are more likely to adopt sustainable farming practices where they have access to reliable technical information, demonstration projects, and institutional support. However, where such support is weak or uneven, uncertainty about pest management, soil fertility, certification requirements, and profitability can become a barrier to transition. More recent policy-oriented work in Canada has likewise emphasized the need to strengthen organic extension, research capacity, and transition support to enable more farmers to move into organic systems (Canadian Organic Growers, 2025). Taken together, this literature suggests that adoption depends not only on market opportunity but also on whether farmers feel adequately supported through practical training, technical advice, and accessible institutional resources.

2.9.4 Organic Agriculture in British Columbia

British Columbia is especially relevant to the study of organic agriculture adoption because of its ecological diversity, strong consumer market, and broader public interest in sustainable food systems. Agriculture in the province spans a range of ecological regions and production systems, including fruit, vegetables, dairy, greenhouse crops, agronomic crops, livestock, mixed farming, and specialty crops (Government of British Columbia, 2024). This diversity creates opportunities for different forms of organic production, but it also means that adoption conditions vary across the province.

British Columbia has also shown increasing institutional interest in environmental sustainability, regenerative agriculture, and climate-resilient food systems. Provincial materials emphasize the role of agriculture in environmental stewardship, biodiversity conservation, and long-term ecological sustainability (Government of British Columbia, 2024). This wider sustainability orientation helps explain why the province is often seen as fertile ground for organic agriculture. However, consumer demand and public environmental awareness have not been matched by a similarly strong and consistent rate of farmer adoption, making British Columbia a useful context for examining the tensions among market opportunity, sustainability discourse, and on-farm transition.

Organic agriculture in British Columbia is also supported by a provincial certification and oversight structure that operates alongside the national organic regulatory framework. Since

September 2018, organic food and beverage products marketed exclusively within British Columbia have required provincial organic certification (Government of British Columbia, 2022). In practice, farms and businesses in the province can become certified through the BC Certified Organic Program (BCCOP) and/or the Canada Organic Regime (COR) (Organic BC, 2026). Organic BC's certification resources identify certification bodies operating in this landscape, including the Pacific Agricultural Certification Society (PACS) and the Fraser Valley Organic Producers Association (FVOPA). At the same time, the province-wide system itself is coordinated through Organic BC, formerly the Certified Organic Associations of British Columbia (COABC) (Organic BC, 2026). These bodies help inspect farms, verify compliance with the Canadian Organic Standards, support record preparation, and guide producers through certification and renewal. In this way, they serve not only as regulatory gatekeepers but also as practical support actors within BC's organic agriculture system. Nevertheless, certification may still be perceived as demanding because it involves administrative work, transition requirements, inspection procedures, and ongoing compliance obligations, all of which can influence how feasible adoption appears to farmers (Cranfield et al., 2010; Padel, 2001).

Despite the presence of certification systems, organic associations, and broader sustainability-oriented initiatives, support for organic agriculture in British Columbia appears more diffuse than coordinated. While the province has developed programs and policy language around sustainability and regenerative agriculture, the support environment for organic transition remains less clearly structured than in some other Canadian jurisdictions. This matters because previous research shows that adoption is shaped not only by farmer motivation or market demand, but also by the strength of extension systems, certification support, technical assistance, and broader policy coordination (Prokopy et al., 2008; Van der Ploeg et al., 2012). In this regard, Quebec provides a useful point of comparison, as it has developed a more explicit and coordinated framework for supporting organic agriculture, offering insight into the kinds of institutional and policy supports that may still be limited in British Columbia

2.10 Policy and Institutional Contexts: Lessons from Quebec for Organic Agriculture in British Columbia

A comparative examination of Quebec and British Columbia reveals how policy and institutional contexts dramatically shape organic agriculture adoption outcomes and provides valuable insights into British Columbia’s challenges and opportunities in this regard. Quebec stands as Canada's organic agriculture leader. As of 2021, 8.4% of its farms reported organic production, accounting for approximately 65% of Canada's certified organic vegetable land (Statistics Canada, 2022; Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ), 2023). This high engagement with organic agriculture is not accidental. However, it is underpinned by a coherent, long-term, and supportive policy ecosystem orchestrated by Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec, MAPAQ. Key supports include:

- **Financial incentives:** A program covering up to 70% of organic certification costs ($10,000 for pre-certification and $10,000 for certification), significantly reducing this entry barrier.
- **Robust research & extension:** Dedicated provincial research institutes (e.g., Institut de Recherche et de Développement en Agroenvironnement (IRDA)) and extension agents specifically trained in organic methods.

- **Strong domestic market development:** Strategic government and institutional procurement policies favouring local organic products, building reliable demand.
- **Farmer-led networks:** A dense network of cooperatives and farmer organizations that facilitate knowledge exchange and collective marketing (MAPAQ, 2023; Canada Organic Trade Association, 2021).

British Columbia presents a stark contrast to Quebec in terms of participation in organic farming. Only 3.2% of British Columbia farms are organic, and the province accounts for only about 7.7% of the national organic vegetable land area (Statistics Canada, 2022). While British Columbia has a strong consumer demand for organic products and a vibrant cohort of organic farmers, the institutional support architecture is fragmented and less direct. Support often comes through broader 'sustainable agriculture' or 'climate adaptation' initiatives, such as the Regenerative Agriculture and Agritech Network (RAAN), rather than targeted organic transition and support programs (Government of BC, 2022). There is no provincial equivalent to Quebec's cost-sharing program for certification. Extension services of the British Columbia Ministry of Agriculture and Food (BCMAF), while ostensibly in place, have historically been oriented toward conventional production, leaving knowledge development and transfer for organic agriculture to rely on non-profit organizations and farmer-to-farmer networks, which can be uneven and inconsistent in reach (Canada Organic Trade Association, 2021).

2.11 Factors Influencing the Adoption of Organic Agriculture

The adoption of organic agriculture is shaped by a complex set of interacting factors operating at multiple levels, including farmer values, knowledge systems, market conditions, certification requirements, and institutional support. Existing research shows that farmers do not adopt or reject organic agriculture for a single reason. Rather, adoption is influenced by how organic farming is perceived in relation to risk, practicality, long-term viability, and the wider conditions within which farmers operate (Knowler & Bradshaw, 2007; Prokopy et al., 2008; Padel, 2001). This is especially relevant in Canada and British Columbia, where demand for organic products has grown substantially, but farmer uptake has remained comparatively limited.

2.11.1 Farmer Characteristics, Knowledge, and Values

Personal values, prior experiences, perceptions of risk, and broader farming philosophies strongly influence farmer decisions. Adoption of organic farming methods is more likely when farmers demonstrate a strong land stewardship ethic, openness to innovation, and a long-term view of soil and environmental health (Prokopy et al., 2008; Carlisle, 2016). Farmers who regard farmland as a legacy for future generations are often more willing to invest in soil-building practices and ecological resilience over time (Carlisle, 2016). Positive prior experiences with ecological practices, even at a limited scale, can also increase receptiveness to organic transition (Prokopy et al., 2008). In this sense, organic agriculture is often not only a technical production choice but also a value-oriented approach to farming, shaped by environmental responsibility, ethical considerations, and concern for the long-term effects of synthetic inputs (Padel, 2001; Reganold & Wachter, 2016).

2.11.2 Access to Knowledge, Training, and Social Networks

The availability of relevant, credible, and accessible knowledge is one of the most important factors influencing the adoption of organic agriculture. Organic farming requires context-specific ecological knowledge related to soil fertility, pest management, crop rotation, biodiversity, and long-term resilience. For this reason, farmers are more likely to adopt organic practices when they can draw on trusted information sources such as successful organic farmers, demonstration sites, mentorship relationships, and practical extension support (Kroma, 2006; Rogers, 2003). Social learning is particularly important because it reduces uncertainty and allows farmers to observe how organic practices work under real local conditions. Canadian research also shows that mentorship and peer-to-peer learning can be especially effective in helping farmers build confidence in ecological farming systems (Laforge & McLachlan, 2018). In British Columbia, this issue appears particularly important because organic-specific extension support has historically been less visible and less coordinated than conventional agricultural support, which may partly explain why producers often rely more heavily on farmer networks and informal knowledge exchange to guide transition decisions.

2.11.3 Perceived Economic Factors and Risk

Perceived economic feasibility remains central to adoption decisions. Although organic markets may offer price premiums, many farmers perceive the transition period as financially risky because it may involve yield uncertainty, higher labour demands, new management requirements, and uncertainty about stable market access (Cranfield et al., 2009; Knowler & Bradshaw, 2007; Padel, 2001). The transition to certification is especially important because farmers may face increased costs and practical challenges before they can benefit from organic price premiums. Secure land tenure can also shape adoption, as producers are less likely to invest in long-term soil-building practices when they lack confidence in continued access to the land (Meinzen-Dick et al., 2017). These issues are especially relevant in British Columbia, where high land costs, varied agroecological conditions, and the predominance of small- and medium-scale operations can further complicate the perceived feasibility of transition. In this regard, market demand is important, but it does not eliminate the practical and financial concerns farmers face when adopting organic systems.

2.11.4 Regulation, Certification, and Institutional Support

Government policy, certification systems, and institutional support structures can strongly influence whether organic agriculture is viewed as realistic and worthwhile. In Canada, organic agriculture operates under the Canada Organic Regime and the Canadian Organic Standards, with the Canadian Food Inspection Agency (CFIA) responsible for oversight of products marketed as organic in interprovincial and international trade (CFIA, 2024). Certification bodies accredited under this framework inspect operators and verify compliance with national standards related to production, processing, labelling, and handling (CFIA, 2024). In British Columbia, this national framework operates alongside the provincial certification landscape, including the BC Certified Organic Program and certification bodies and associations linked to Organic BC (Organic BC, 2026). These bodies play an important role in maintaining the credibility of organic labelling, but they also shape adoption, as farmers often perceive certification as administratively burdensome, time-consuming, and costly, especially during the transition (Cranfield et al., 2010; Padel, 2001).

More broadly, previous studies show that adoption is more likely where farmers have access to transition cost-share programs, technical assistance, organic research, and coordinated policy support (Van der Ploeg et al., 2012; Prokopy et al., 2008). In this respect, provincial differences matter. Quebec is often presented as having stronger, more coordinated institutional support for organic agriculture. In contrast, British Columbia appears to rely more on a mix of certification structures, organic associations, and broader sustainability initiatives rather than on a clearly integrated provincial support framework. This helps explain why adoption should be understood not only in terms of farmers' motivation but also in relation to broader governance and institutional conditions.

2.11.5 Socio-Cultural Norms and Community Influence

Socio-cultural norms and the presence or absence of a supportive community of practice also shape adoption. Rogers (2003) emphasizes that innovations spread more readily when they gain social legitimacy and are reinforced through trusted networks. Farmers are therefore more likely to adopt ecological practices when they can see others doing so successfully and when those practices are not treated as marginal or unrealistic. In some settings, strong farmer cooperatives, local demand, and visible organic communities can normalize organic farming and reinforce adoption cycles (Canada Organic Trade Association, 2021). In British Columbia, however, organic agriculture may still be perceived in some contexts as alternative or niche, which can slow its diffusion beyond early adopters (Padel, 2001). At the same time, interest in organic and regenerative farming in BC is increasingly linked to broader discussions of stewardship, ecological responsibility, and long-term care for land and food systems, including perspectives aligned with Indigenous and land-based approaches to intergenerational sustainability (Whyte, 2018). These socio-cultural dimensions influence not only whether farmers adopt organic farming but also whether they see it as legitimate, credible, and compatible with local farming identities.

2.11.6 Market Access and Infrastructure

Market access is another important influence on adoption. Although consumer demand for organic food is significant, farmers are unlikely to transition unless they have access to workable channels for marketing certified products. Market viability, therefore, depends not only on demand itself but also on the availability of processing facilities, distribution networks, certification systems, and stable returns (Knowler & Bradshaw, 2007; COTA, 2021). In British Columbia, direct-to-consumer pathways such as farmers' markets, community-supported agriculture, and local procurement initiatives can create more accessible routes to market for some producers, especially at smaller scales. However, market opportunities remain uneven across regions, depending on infrastructure, scale, and compliance costs. This means that consumer demand should be understood as a necessary but insufficient condition for adoption. Farmers may recognize that the market exists, but still hesitate when market access is uncertain or when the infrastructure needed to support organic production and distribution is weak.

Overall, the literature supports the view that the adoption of organic agriculture is shaped by a combination of environmental, economic, social, and institutional influences that operate together rather than independently. However, these influences are often discussed in isolation. Relatively limited research has examined the adoption of organic agriculture using the combined Diffusion of Innovations and Social-Ecological Systems frameworks. Bringing these perspectives together helps explain how farmer perceptions, social learning, economic risk, governance arrangements, and support systems interact to shape adoption in practice. This integrated perspective is especially useful in British Columbia, where strong consumer demand and sustainability discourse coexist with weak adoption, making it necessary to understand organic agriculture as both a farmer-level and a system-level transition proposition.

2.12 Challenges and Critiques of Organic and Regenerative Agriculture

Despite their benefits, both systems face substantive critique:

For organic agriculture:

- Certification burden: cost, paperwork, and inspection process can be prohibitive for small-scale farmers, creating an equity issue.
- Input substitution versus system redesign: some operations replace synthetic fertilizers and pesticides with organic alternatives, without fully redesigning the farm as a resilient agroecosystem.
- Yield gap debate: meta-analyses suggest organic yields can be lower, particularly in staple grains, raising land-use efficiency questions.
- Labour intensity: Organic pest management is more knowledge- and labour-intensive. Weed control in particular is very challenging.

For Regenerative agriculture:

- Definitional ambiguity and ‘greenwashing’: Lack of legal definition allows loose application, potentially diluting meaning and credibility.
- Context-specificity and knowledge demands: Application is highly site-specific, requiring deep ecological literacy, which conventional farmers and extension personnel often lack.
- Scalability and supply chain barriers: Mainstream commodity chains built for volume and uniformity marginalize diverse regenerative products.
- Social and equity critiques: Can reproduce colonial patterns by appropriating Indigenous knowledge without justice, or ignoring land access and labour equity (Daigle, 2017).

2.13 Theoretical Frameworks

An integrated Diffusion of Innovations and Socio-Ecological Systems framework was employed in this study to analyze interactions among individual farmers, their social networks, and institutional and environmental factors influencing the adoption of organic farming practices.

2.13.1 Diffusion of Innovation Theory

Diffusion of Innovation theory (Rogers, 2003) has been widely and successfully applied in agricultural studies to explain the uptake of new practices, such as conservation tillage and integrated pest management (Pannell et al., 2006; Knowler & Bradshaw, 2007). The theory posits that adoption unfolds over time through a series of communication channels, influenced by the innovation's perceived attributes. Regarding this study, organic agriculture is considered an innovation.

Diffusion of Innovation provides a structured model to assess the cognitive and social journey of British Columbia farmers through five stages:

- **Knowledge:** The farmer is exposed to the innovation's existence and gains understanding (e.g., through training workshops, demonstrations, etc.).
- **Persuasion:** The farmer forms a favourable or unfavourable attitude toward innovation (e.g., through peer learning or cost-benefit assessment).
- **Decision:** The farmer engages in activities that lead to a choice to adopt or reject.
- **Implementation:** The farmer puts the innovation into use (e.g., adoption of innovation).
- **Confirmation:** The farmer seeks reinforcement for the innovation decision and may reverse it if exposed to conflicting messages (e.g., the presence or absence of policy validation).

Five perceived attributes of the innovation heavily influence the progression through these stages:

- **Relative advantage:** Is organic agriculture seen as better than conventional methods?
- **Compatibility:** Does it align with farmers' values, experience, and needs?
- **Complexity:** How difficult is it to understand and implement?
- **Trialability:** Can farmers test the practices on a small scale before full adoption?
- **Observability:** Are the benefits, such as healthier soils or access to premium markets, apparent?

Scholars have consistently found that practices perceived as offering a clear relative advantage (e.g., economic benefit or ecological improvement), being compatible with existing values and farm operations, and being relatively simple (i.e. not highly complex) are adopted more rapidly (Rogers, 2003; Prokopy et al., 2008).

Diffusion of Innovation is particularly valuable for evaluating where in the adoption process farmers stall in adopting organic practices, such as experimenting with new methods, fully implementing innovations, or committing to long-term changes. For instance, a conventional apple farmer in the Okanagan region of British Columbia may know about organic agriculture but perceive its adoption as overly complex due to region-specific pest challenges and a lack of understanding of organic pest management methods and tools, thereby halting consideration of adoption at the persuasion stage.

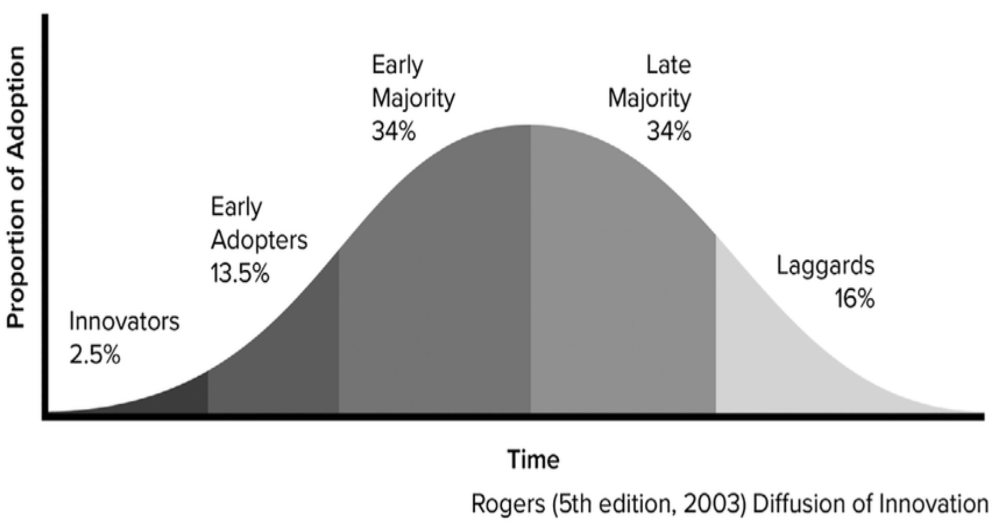
Furthermore, Rogers (2003) categorizes adopters into the following categories:

- **Innovators**: They are venturesome and the first to try new ideas, and are more willing to cope with uncertainty and risk.

- **Early Adopters**: They are associated with respect and are often looked to by others as opinion leaders and role models.
- **Early Majority**: They are deliberate and often adopt ideas before the average members, but only after careful consideration.
- **Late Majority**: They are skeptical, and they adopt ideas only after uncertainty has declined and after many others have already adopted.
- **Laggards**: They are traditional and are the last to adopt ideas; they are mostly oriented towards established practices and cautious about change.

As shown in Figure 2.2, these categories can be used to characterize the distribution of British Columbia's farming community based on their readiness to adopt organic practices. Separately, understanding these categories can help identify the communication networks and peer influence pathways that accelerate the Diffusion of Innovation.

Figure 2.2 *Diffusion of Innovation: Rogers' Adoption Stages*



Source: Gabriel (2023)

2.13.2 Socio-Ecological Systems Framework

While Diffusion of Innovation seeks to explain individual behaviour, the Socio-Ecological Systems framework (Ostrom, 2009; McGinnis & Ostrom, 2014) is useful for analyzing the broader, multi-level system within which a farmer's decisions are made. The Social-Ecological Systems framework is a foundational tool in resource management and sustainability science, designed to analyze the complex interactions between resource systems, governance structures, and actors (Charnley et al., 2017).

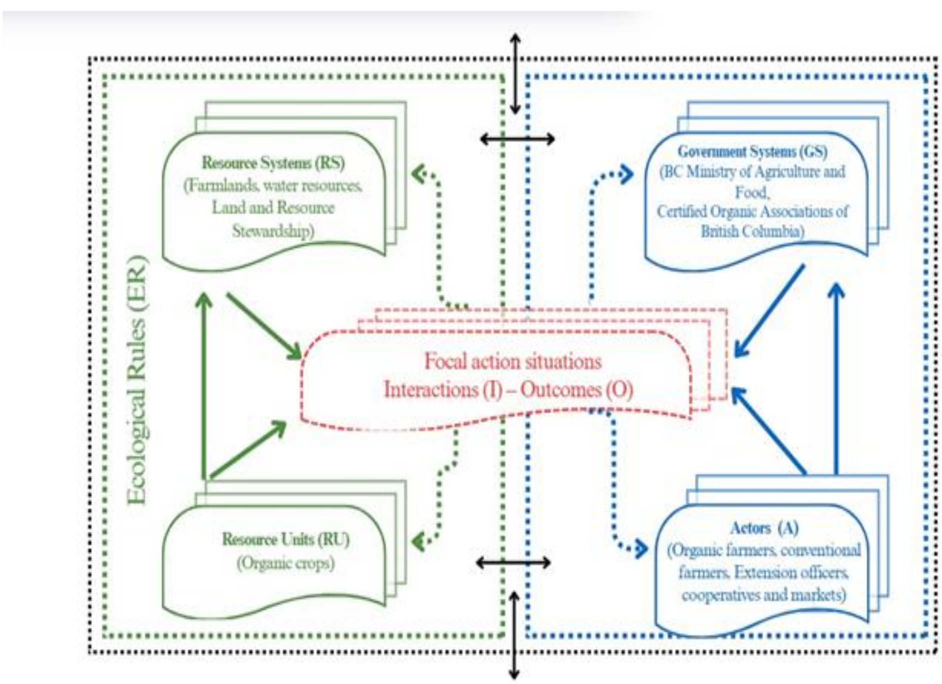
For this study, the Social-Ecological Systems framework is operationalized through the following core subsystems, which serve as the key analytical dimensions for examining how ecological, institutional, and social elements interact in shaping organic agriculture adoption in British Columbia:

- **Resource systems (RS):** The specific agro-ecological zones, farmlands, and water resources of British Columbia.
- **Resource Units (RU):** The specific products that are being managed, such as crops and livestock, which are generated via the resource system.
- **Governance Systems (GS):** The multi-layered institutional landscape, including provincial agricultural policies (BC Ministry of Agriculture and Food), federal organic regulations (Canadian Organic Standards), certification bodies (Certified Organic Associations of British Columbia), and market governance.
- **Actors (A):** The key participants: conventional and organic farmers; extension agents; input suppliers; processors; retailers; consumers.

- **Interactions (I) and Outcomes (O):** The patterns where subsystems meet, producing outcomes like adoption rates or measurable soil health attributes.

The framework's primary utility for this research lies in its diagnostic power for comparative systems analysis. The framework facilitates pinpointing specific interaction failures, such as how a provincial policy (GS) fails to mitigate the high-cost barrier of certification for a small-scale farmer (A), or how the lack of region-specific knowledge for arable soil management (an RS characteristic) is not met by current extension services (a function of GS), increasing the perceived complexity for farmers (A) and thus directly linked to a Diffusion of Innovation attribute. These interactions can be demonstrated as shown in Figure 2.3.

Figure 2.3 *Applied Socio-Ecological Systems Framework for Analyzing Organic Agriculture Adoption in British Columbia*



3. Methodology

3.1 Study Area

This study was conducted in British Columbia, Canada. British Columbia covers approximately 92 million hectares of land (Statistics Canada, 2022). The province contains diverse physiographic regions and climatic conditions that influence agricultural production systems.

A wide range of commodities and production systems characterizes the agricultural landscape of British Columbia. Dairy and berry production are concentrated in the southwest, particularly in the Lower Mainland. Tree-fruit and wine grape production occur primarily in the central interior, especially in the Okanagan Valley. Large-scale ranching and agronomic crop production are more common in northern and interior regions of the province (Figure 3.1) (Government of British Columbia, 2024).

Agricultural land in British Columbia is limited relative to the total land base. Approximately 5% of the provincial land area is suitable for agriculture (Statistics Canada, 2022). About 4.7 million hectares of land are included in the Agricultural Land Reserve (ALR), which restricts the land therein to approved agricultural and food system uses only. The ALR is administered by the Agricultural Land Commission (2024). According to the 2021 Census of Agriculture, British Columbia has 15,841 farms occupying approximately 2.29 million hectares of farmland, with an average farm size of about 144 hectares. The province also has 23,680 farm operators (Statistics Canada, 2022).

British Columbia is part of the Canadian organic agriculture sector. In 2023, the Canadian organic market generated more than $9 billion in revenue (Organic Federation of

Canada, 2023). However, organic food production in Canada has not grown fast enough to meet rising demand. Therefore, British Columbia provides a relevant environment for researching this contradiction.

Figure 3.1 *Map of British Columbia showing the Agricultural Regions*

Source: Government of British Columbia (2024)

3.2 Research Design

This was a qualitative study that approached the investigation on the assumption that social realities are constructed through people's individual experiences and the meanings they assign to them. Accordingly, farmers' choices were considered in terms of how they position and justify their actions in light of their worldviews (i.e., realities) and technical and economic considerations (Denzin & Lincoln, 2011). This approach was deemed appropriate given the British Columbia farming context, where farmers routinely face the challenge of economic viability regardless of their inclination to steward the environment and society. Farming method choices can only be understood through close attention to farmers' lived experiences and perceptions. Furthermore, the study assumed that farming decisions are made based on local contextual factors rather than on general rules applicable everywhere (Pervin & Mokhtar, 2022).

For this research, I interviewed 30 individuals comprising conventional farmers (n=10), organic farmers (n=10), and other affiliated professional actors (n=10) in the agri-food system. This design enabled the comparison of responses between groups while also accounting for each participant's individual circumstances (Yin, 2018). The comparative analysis of interview responses was conducted in a structured manner.

Participants were also categorized by farm size and years of farming. This way, I was able to explore the interactions between larger structural influences (e.g., farm size) and individual influences (e.g., personal values and motivations). Analysis focused on respondent experiences and perceptions, in an effort for the study findings to more accurately reflect the actual interests, perceptions and opinions of participants in British Columbia's agriculture sector.

3.2.1 Researcher Positionality

As the researcher, I approach this study with a background in agricultural science, experience with farming and agriculture in Nigeria, and current academic training in Canada. These experiences fostered my passion for organic and sustainable agriculture and food systems, and my drive to learn more about the barriers to adopting organic agriculture in BC and why farmers in the province are not widely adopting it. I recognized that my background and interest in sustainable agriculture could influence how I understood and interpreted the participants' views. To counter this, I was aware of reflexivity throughout the research process, employed systematic coding procedures and maintained a reflexive journal to monitor my assumptions and minimize biases.

3.3 Theoretical Frameworks

I utilized two theoretical frameworks, Diffusion of Innovation and the Socio-Ecological Systems framework, alongside inductive thematic analysis. The combination of these three approaches facilitated analysis and comprehension of adoption choices at both the individual and system levels.

The analysis combined deductive and inductive coding. First, the Diffusion of Innovation and Social-Ecological Systems frameworks informed the development of the interview guide, and the initial deductive coding framework was applied to the interview transcripts. Diffusion of Innovation-informed codes were used to analyze how farmers described their perception of organic agriculture, including its perceived advantages, challenges, and communication channels (as shown in Figure 3.3), and the influence of social networks on awareness and decision making. Codes informed by the Social-Ecological Systems framework were used to examine broader structural and contextual factors shaping adoption and non-adoption, including the roles of natural resources, governance systems, institutional arrangements, and relevant actors (Figure 3.2).

Following the deductive stage, inductive thematic analysis was used to identify additional themes emerging from the data that were not fully captured by the Diffusion of Innovation and the Social-Ecological Systems frameworks, particularly local, social, and cultural dimensions of organic agriculture adoption in British Columbia. A list of codes and themes, along with the relevant frameworks associated with each, is provided in Appendix E.

Figure 3.2 *Conceptual Framework Integrating the Socio-Ecological Systems Framework for Organic Agriculture Adoption in British Columbia*

Source: Adapted from Ostrom (2009)

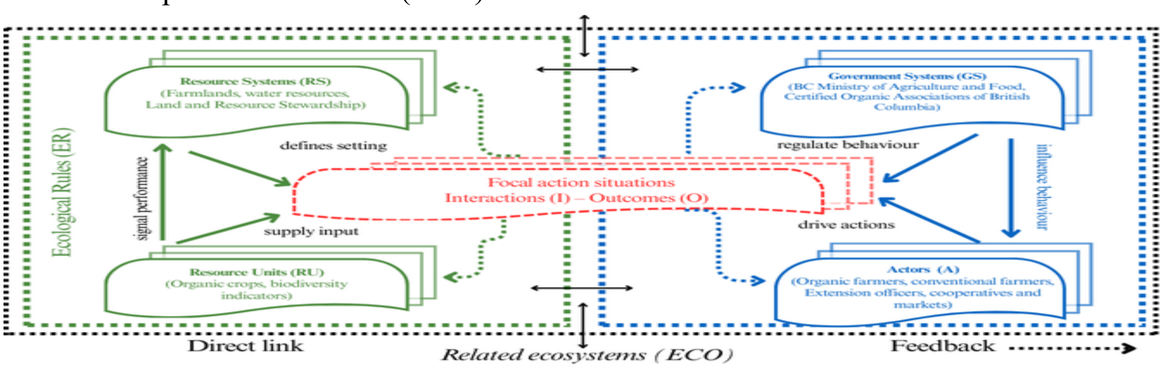
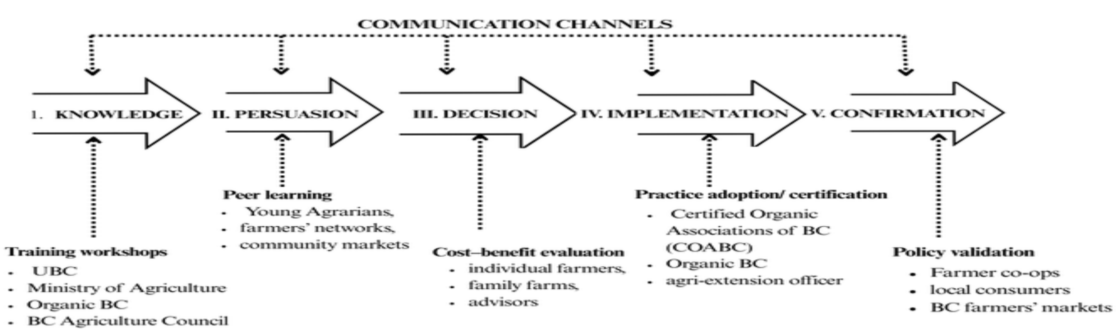


Figure 3.3 *Diffusion of Innovation Process for Organic Agriculture Adoption in British Columbia*



Source: Adapted from Rogers (2003)

3.4 Sampling Strategy

Both purposive and snowball sampling were utilized to identify and recruit study participants. To ensure that participants were closely aligned with the research purpose and reflected a broad spectrum of views within the British Columbia agricultural industry, farmer participation was limited to those who operated on agricultural land in British Columbia (Patton, 2015).

Purposive sampling was first used to identify participants with direct, relevant, and considerable experience and knowledge of either conventional or organic farming methods. Participants were identified through public directories, organic association lists, farm websites, local networks, and known agricultural organizations. Eligibility was then assessed based on farming type, location in British Columbia, and relevance to the study questions. After the initial set of participants had been interviewed, snowball sampling was used to recruit additional respondents. Participants were asked to recommend other individuals within their professional or farming networks who met the study criteria. These referrals were then contacted and invited to participate in the study.

The farmers and agricultural professionals included in the study were chosen to represent their opinions on policy, extension, certification systems, and agricultural support systems for organic food production in British Columbia. The participants came from various organizations and institutional types linked to the agricultural sector, such as academic institutions, certification bodies, agricultural councils, provincial agricultural ministries, local government agricultural programmes, organic agriculture networks, extension services, and farmer support organizations.

In this study, specific institutional or organizational affiliations were not identified to ensure participant confidentiality and the ethical commitment of research approved by Royal Roads University. Similarly, the names and addresses of individual farms and respondents have been anonymized throughout the study. Among the participants, purposive sampling was used to select 6 organic farmers, 4 conventional farmers, and 10 affiliated professionals, while snowball sampling was used to select 4 organic farmers and 6 conventional farmers.

The thirty (30) participants were chosen to allow for a thorough qualitative analysis, to ensure sufficient diversity of perspectives, and to be manageable for the context of the master's thesis. Conventional farmers, certified organic farmers, and affiliated agricultural professionals were included in the study, enabling it to explore the adoption of organic agriculture from various perspectives relevant to the research questions. This sampling approach enabled the comparative analysis of varied experiences among farmers, institutional roles, and attitudes regarding the adoption of organic agriculture in British Columbia.

In addition, farmers were classified by farm size and years of farm experience to investigate whether structural and operational differences might affect their perceptions of organic agriculture. Smaller-scale farms were those with less than 35 acres of agricultural land, and larger-scale farms were those with more than 35 acres of agricultural land. Farming experience was also grouped into short-term (0-14 years), medium-term (15-35 years) and long-term (more than 35 years). These categories were created for analytical comparison within the sample, not to replicate formal provincial classifications. The acreage threshold was used to distinguish between lower- and larger-scale operations to support the interpretation of differences in management and adoption. The experience bands were used to compare shorter-, medium-, and longer-term farming trajectories within the sample.

3.5 Interviewing and Data Collection

Semi-structured in-depth interviews were conducted with participants (n=30). An interview guide (Appendices B-D) was developed and utilized to ensure relatively uniform discussion for all interviews. The semi-structured approach provided flexibility, enabling participants to raise relevant issues and considerations not directly referenced in the interview guide. The interview questions, designed to capture perspectives on farming methods, were formulated to align with the Diffusion of Innovation framework. The Social-Ecological Systems framework informed the construction of policy, institutional, and resource-utilization questions.

Interviews were conducted either face-to-face on participants' farms or via Zoom between July 2025 and December 2025. Interviews ranged in duration from 45 to 60 minutes. All interviews were recorded with participants' consent and transcribed verbatim to ensure accuracy and to aid identification of recurring language patterns and determination of initial themes before formal coding with NVivo 14 (Lumivero, Denver, Colorado, USA).

3.6 Validity and Reliability of Instrumentation

The semi-structured interview guide underwent expert review and pilot testing to ensure reliability and validity. The questions were directly aligned with the research objectives to ensure they effectively probed awareness, barriers, and motivations for adopting or rejecting organic agricultural methods. For example, questions about relative advantage were cross-validated with the Diffusion of Innovation constructs, while systemic-level questions were aligned with the Social-Ecological Systems variables.

3.7 Data Analysis

After transcription, NVivo 14 was used to conduct thematic analysis of the data, following the six-step process described by Braun and Clarke (2006). In the first stage, the transcripts were coded deductively using predetermined categories derived from the Diffusion of Innovation and Social-Ecological Systems frameworks. In the second stage, inductive thematic analysis was used to identify themes emerging directly from the coded data. Additional codes were developed to capture themes not adequately addressed by the initial deductive categories, such as program eligibility restrictions and competing policy priorities. To maintain consistency and clarity across themes, codes were revised and refined several times in line with best practices in qualitative analysis (Allsop et al., 2022).

3.8 Ethical Considerations

The research complied with existing ethical principles for research involving human subjects per Royal Roads University Research Ethics policy. Before data collection, every participant was provided with a letter of information and consent for research participation explaining the study's objective, the voluntary nature of participation, and the right to withdraw at any time without penalty (Hosseini Rezaei & Nikandish, 2014). All participants provided written informed consent. All identifying information was removed from the data to ensure participant confidentiality. Case identification codes were assigned to participants, and no names or specific farm locations were disclosed in reports or transcripts.

All recordings and transcripts of the interviews were saved on encrypted, password-protected computers. A reflexive journal was kept throughout the research process to check and minimize the potential for researcher bias, particularly regarding conventional and organic farming systems.

4. Results and Discussion

This chapter presents the results and discussion in an integrated format. This approach was intentionally chosen to reduce repetition and to enable each thematic finding to be interpreted directly alongside the interview data from which it emerged. Given that the analysis is guided by the Diffusion of Innovations and Social-Ecological Systems Framework, integrating the results with the discussion helps sustain a clear and immediate connection between the empirical evidence and its theoretical interpretation. This structure also improves the chapter's overall coherence by minimizing repeated cross-references and allowing the reader to follow the analytical narrative more smoothly.

4.1 Demographic Profile of Respondents

A total of 30 respondents participated in the study (n=30), categorized into three groups: Conventional Farmers (CF; n=10), Organic Farmers (OF; n=10), and Affiliated Professionals (AP; n=10). The respondents were from various regions of British Columbia, including the Fraser Valley, the Okanagan, and the Comox Valley. The CF group consisted primarily of more experienced farmers who operated comparatively larger farms. Among CF respondents who provided experience data, 80% had over 35 years of farming experience, and 70% had over 50 acres of farmland. The OF group, on the other hand, included more farmers with less experience and smaller farm sizes. Of the individuals who supplied experience data, 40% were farmers with less than 15 years of experience, and 80% had farms of less than 30 acres.

Within the affiliated professional group, 50% of respondents indicated that their work is mainly at the provincial level and included policy formulation, governance, and extension service provision. In comparison, the other 50% stated that their work was regional or local and that they operated in the Fraser Valley, Okanagan, and Kootenays. The demographic characteristics of these respondents are summarized in Table 4.1. Also, the completely anonymized profile breakdown of individual respondents is provided in Appendix A.

*Ta**ble 4.1** Summary of Respondent Characteristics (n=30)*

Attribute	**Category**	**Certified Organic Farmer (n=10)**	**Conventional Farmer (n=10)**	**Affiliated (n=10)**
Farming Experience	Longer-term (> 35 years)	2	4	0
	Medium-term (15 - 35 years)	4	4	0
	Short-term (0 – 14 years)	4	1	0
Farm Scale	Larger (> 35 acres)	2	7	0
	Smaller (0-35 acres)	8	3	0
Location	Fraser Valley	1	5	2
	Vancouver Island	3	2	1
	Okanagan	1	2	1

	Kootenays	2	0	1
	Province-wide	0	0	5
	Comox Valley	1	1	0
	Courtenay	1	0	0
	Thompson-Nicola	1	0	0

Note: *n* represents the number of participants who referred to a theme or code.

4.2 Awareness of Organic Agriculture Among Conventional Farmers (RQ1)

All 10 CF demonstrated a high level of awareness of organic agriculture. The results, however, suggest that this awareness is largely general and anecdotal rather than being based on detailed technical knowledge, formal training or direct experience. Results reveal that their awareness was formed via four primary avenues:

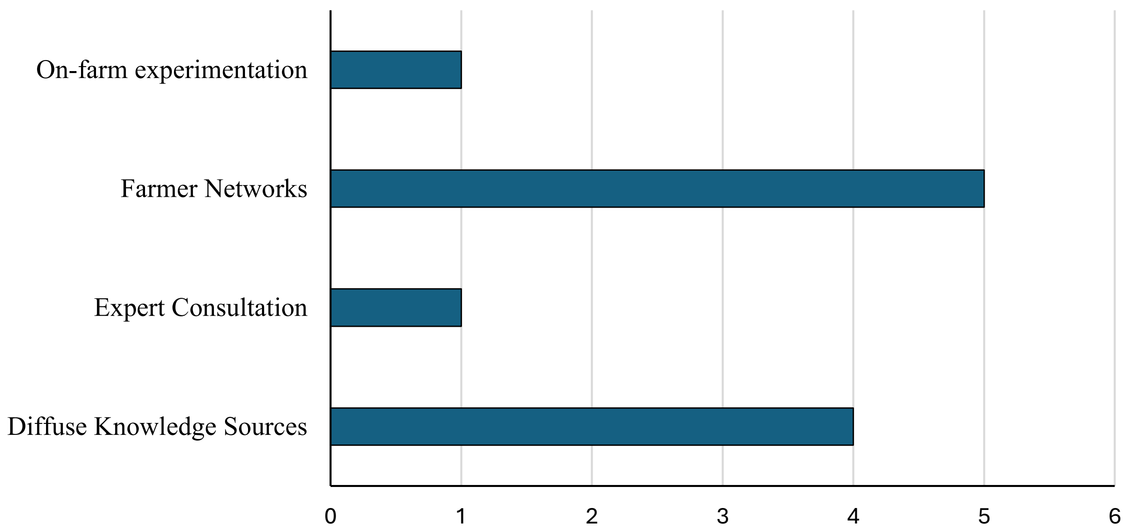
- Farmer networks (n = 5)
- Diffuse knowledge sources (n = 4)
- Limited expert consultation (n = 1)
- Direct experience/on-farm experimentation (n = 1).

The most common source of awareness was farmer networks. Several respondents said they had learned about organic farming through contact with peers, friends, or other nearby farmers. One participant stated, "*… I have a close friend who is an organic berry farmer, and I have a cousin who is an organic farmer…*" (CF-02). Likewise, local observation of other farmers helped facilitate awareness: "*Well, there are a few guys that grow organics around here…"* (CF-03).

Besides direct peer interaction, much of the awareness was based on diffuse, nonspecific, and generalized sources of knowledge. Respondents often qualified what they knew by saying 'I hear', or 'I have heard'. "*I hear a lot. It seems to work well for the smaller, specialized farms…*" (CF-05). Formal or structured knowledge pathways were cited only infrequently. One participant specifically mentioned institutional exposure from participation in an agricultural organization: *"We have been members of the blueberry council… they cover organic farming and the standards of organic farming…"* (CF-04).

The key drivers of awareness that were identified in the interviews are listed in Figure 4.1. The findings suggest that conventional farmers' awareness of organic agriculture in British Columbia is high, but largely socially mediated and indirect. From a Diffusion of Innovation perspective, this reflects the knowledge stage of adoption, in which individuals become aware of an innovation without yet developing a full technical understanding. Awareness, per this study, was driven mainly by interpersonal communication and observability through informal networks rather than formal extension or training. From a Social-Ecological Systems perspective, the findings highlight the importance of social systems and local knowledge networks in shaping agricultural awareness. In this context, farmers themselves appear to function as the main brokers of information about organic agriculture. However, the prominence of peer networks also raises a critical question: do these networks expand informed understanding, or do they sometimes function as closed knowledge systems that reinforce doubt, caution, or the perception that organic agriculture is not feasible?

Figure 4.1 *Awareness of Organic Agriculture Among Conventional Farmers*



4.3 Perception of Organic Agriculture Among Conventional Farmers (RQ1)

All 10 CF demonstrated distinct perceptions of organic agriculture. However, their perceptions were primarily based on in-practice observations, either from neighbouring farms or through agricultural networks. Two major themes shaped perception:

- compatibility with existing farming systems (n=9)
- observability of organic practices through peer farmers (n=7)

CF respondents frequently described their perceptions of organic agriculture in terms of how well it aligned with their farming knowledge and current production methods. One farmer explained, *"We have always been conventional farmers and use conventional techniques"* (CF-02).

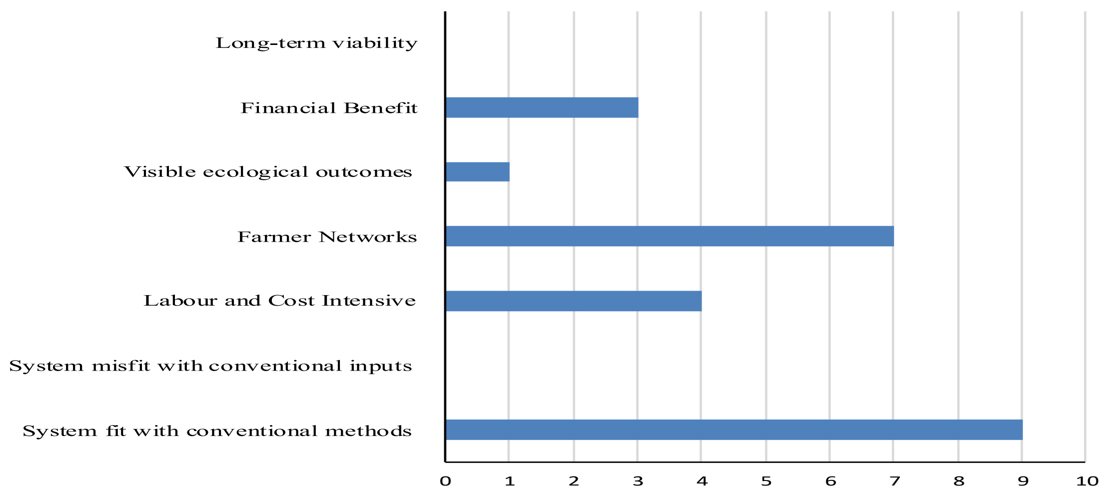
Four out of 10 CF associated the system with environmental and geographical factors, especially in coastal regions, where traditional tillage and crop protection methods were considered necessary. One of the farmers had said, *"Where we are on the West Coast here… it is* *so wet, you have to work the ground"* (CF-03), while another offered that, *"For tree fruit, the practicality is almost zero on this scale. It takes years and massive investment to establish an orchard"* (CF-10).

Unlike environmental or ethical considerations, observability, in the form of farmer networks, emerged as a powerful factor, with 7 CF citing peer observation as important to their perceptions of organic farming practices. CF respondents believed that the presence of other successful producers (early adopters) was a prerequisite for considering change. One respondent remarked that: "*…seeing my neighbours be successful and profitable with a new method is the best incentive"* (CF-05). The most definitive expression of this rationale was conveyed by one of the largest producers, who said, "*If I see a trusted, large-scale grower successfully switching to a new system and staying profitable, that is the most compelling proof there is"* (CF-10).

This suggests that, for some conventional farmers, the perceived viability of organic agriculture depends not only on whether it works, but on whether it can work at a scale comparable to their own operations. As a result, the success of smaller organic farms may not be regarded as sufficiently convincing evidence of scalability or commercial relevance.
The key drivers of perception that were identified in the interviews are shown in Figure 4.2.

Overall, conventional farmers did not reject organic agriculture outright but predominantly did not view it as compatible with the operational realities of their farms. Compatibility emerged as central: from a Diffusion of Innovation perspective, innovations are more likely to be adopted when they align with existing practices, values, and systems. From a Social-Ecological Systems perspective, the findings also show that perception is shaped by embedded social relationships, particularly through farmer-to-farmer knowledge exchange. This suggests that peer demonstration and locally visible examples may be more effective than ‘promotional’ campaigns alone in improving perception and subsequent adoption of organic agriculture.

Figure 4.2 *Perception of Organic Agriculture Among Conventional Farmers*



4.4 Organic Agriculture Barriers (RQ2)

Conventional farmers identified several key barriers that limited their willingness to adopt organic farming methods (Table 4.3). The most frequently reported included:

- Financial risks during the certification transition period (n=8)
- Market uncertainty (n=9)
- Increased labour requirements (n=5)
- Risk regarding yield and pest management (n=4)

Economic risk emerged as the most significant barrier. Eight of the ten (n = 8) CF reported that the three-year transition period for organic certification represented a major financial constraint. One farmer explained, *“During that time, you are putting in all the extra effort and* *cost, but you are not getting any more money for your product. That lack of financial support during the certification process is a massive hurdle"* (CF-08).

Farmers also highlighted labour requirements as another substantial barrier. Five CF respondents noted that organic production requires significantly higher labour input. One CF conveyed, "*The initial capital needed for new equipment, the massive jump in labour costs, and the guaranteed dip in feed yield and quality during the transition period—it all adds up to a huge debt load*" (CF-05).

Four CF respondents mentioned exacerbated arthropod and disease pest pressure as a significant discouragement to farming using organic methods. A CF respondent said, "*I hear about significant yield losses in wet years and the constant, expensive battle with weeds without synthetic herbicides*" (CF-07). Other very specific crop-related risks were cited, such as problems with blueberry blight (*Monilinia vaccinii-corymbosi*) (CF-08) and the fact that apple scab (*Venturia inaequalis*) and apple fruit worms were always a problem (CF-10).

The analysis indicates that the unwillingness of conventional farmers to adopt organic farming methods is not, in the main, due to ignorance or ideological resistance, but to economic uncertainty and anticipated operational risk. Even though most respondents knew a fair bit about organic farming and had witnessed it in their farming communities, they felt the switch was both economically and technically risky. In summary, the transition period for certification, labour needs, and production uncertainty were consistently cited as major reasons for the unwillingness to embrace organic farming.

These findings are consistent with two fundamental factors that affect innovation adoption, according to the Diffusion of Innovations model: perceived complexity and relative advantage (Rogers, 2003). Farmers are unlikely to adopt a new system when they believe it is hard to implement, will require a significant change in current practice or will require extensive new knowledge. Most CF respondents shared the view that organic farming required more intense management than conventional systems. Further, the production of organic food was often associated with increased labour requirements and costs, greater pest and disease management effort (e.g. monitoring), and greater uncertainty about yield. Such assessments, regardless of accuracy, reinforce the perceived complexity of the innovation and hinder its adoption. In the final analysis, CF respondents were quite doubtful of the relative economic advantage of organic farming, especially in the transitional phase.

Although organic products can fetch higher prices in the market, respondents noted that higher prices typically do not materialize until certification is achieved. The product can be labelled and sold as organic. During the three-year transition period, farmers will be required to practice organic farming methods but will not be able to sell their goods as certified organic. As a result, farmers consider this period to be one of substantially increased financial vulnerability, when production costs rise, and earnings are unpredictable. According to Diffusion of Innovation, innovations that cannot demonstrate clear short-term benefits will not be readily adopted by potential adopters. This suggests a contrast in decision-making time horizons: conventional farmers tended to evaluate organic transition based on immediate economic risks and operational disruptions, whereas organic farmers were more willing to absorb short-term challenges in support of broader ecological and values-based farming objectives.

For many conventional farmers, the economic viability of farm operations is a key factor in decision-making and strongly shapes the choice of production methods. Farm viability, as viewed by CF respondents, was defined in terms of stable income streams, stable purchasers, and stable yields. This finding elucidates the importance of market structures and institutional conditions in the adoption of innovation, as emphasized in the Social-Ecological Systems model. According to Ostrom (2009), decisions to adopt are not made solely at the individual level but are also shaped by interactions among actors, governance systems, and market environments. In this respect, organic farming was regarded as a break from familiar, relied-upon economic relationships with purchasers, distributors, and markets.

Another constraint that commonly appeared in the data is labour needs and availability. Some CF respondents conveyed that organic farming methods, particularly mechanical weed control and increased crop spacing, would require more labour than conventional farming. This condition presents an additional impediment to change in regions where agricultural labour is already scarce or costly, as in British Columbia. In the context of Social-Ecological Systems, these conditions reflect the interaction of broader labour-market forces with farm-level decision-making processes that shape farm practices.

Pest management was among the technical risks that contributed to CF's reluctance to adopt organic methods. Respondents expressed concern that organic systems lack adequate pest-control tools and methods, especially given wetter weather patterns and the presence of high-value, perishable crops, such as small fruits in coastal southwest British Columbia. Such concerns highlight the interplay between resource-system features (i.e., climate and crop type) and knowledge of management practices influencing farming method adoption decisions.

Collectively, these results suggest that adoption choices are shaped by a combination of economic risk, the institutional framework, labour supply, and perceptions of technical uncertainty.

Table 4.2 *Reported barriers to adopting organic practices by Conventional Farmers.*

Barriers	**Conventional Farmer**
Climate Issues	4
Weeds or disease	4
Certification	3
Costs of labour and inputs	5
Market uncertainty	9
Profitability issues	9
Transition period risk	4
Regulatory paperwork	4
Transition funding gap	2

4.5 Motivations for Organic Adoption (RQ3)

OF respondents described their adoption of organic agriculture as being shaped primarily by ecological, social, and human health-oriented motivations. Key motivations, as shown in Figure 4.3, included:

- Ethical and moral motivation (n=10)
- Environmental stewardship (n =8)
- Concerns about soil health and biodiversity (n=10)

- Food quality and human health considerations (n =8)

All OF (n=10) said they had never practiced conventional farming and chose organic agriculture from the outset, rather than transitioning from conventional agriculture. They spoke of practicing organic farming and obtaining certification as immediately as possible. One explained, "*I farmed for 3 years previous to this and was not certified organic, but farmed with organic methods, so I never farmed conventionally*" (COF-03). Another respondent described adoption as conscious and immediate, sharing, *"We did not transition. We just broke ground… and then applied for certification"* (COF-08).

Environmental stewardship was the prime driver of adoption (n = 8); the OF respondents made it clear that land management should be carried out with minimal adverse impacts on the environment and ecosystem integrity. One OF respondent noted, "*I think it is a better system for biodiversity, just better for the environment*" (OF-04). Frequently, issues related to soil health and biodiversity (n=10) were raised, and OF respondents cited observable improvements in soil quality and ecosystem activity. For example, one OF respondent remarked: *Commonly, we will be out in the vegetables, and we will see tree frogs, which can only live in very clean environments… Indicators that species do well in non-contaminated areas. The soil health has improved significantly since we started."* (OF-03).

Some respondents also compared the current state of their soil to its degraded condition prior to the introduction of organic management. One said: *"The ground was very low [in] organic matter, hard, compacted… the organic matter has increased, and the workability has become much, much better. It is noticeably better over the years."* (OF-07).

Further, the quality of food and health considerations of human beings (n=8) were also found to influence adoption, as farmers felt that organic production allows them to produce healthier food for consumers:

"*Organic agriculture is better for the environment and better for human health*" (OF-01).

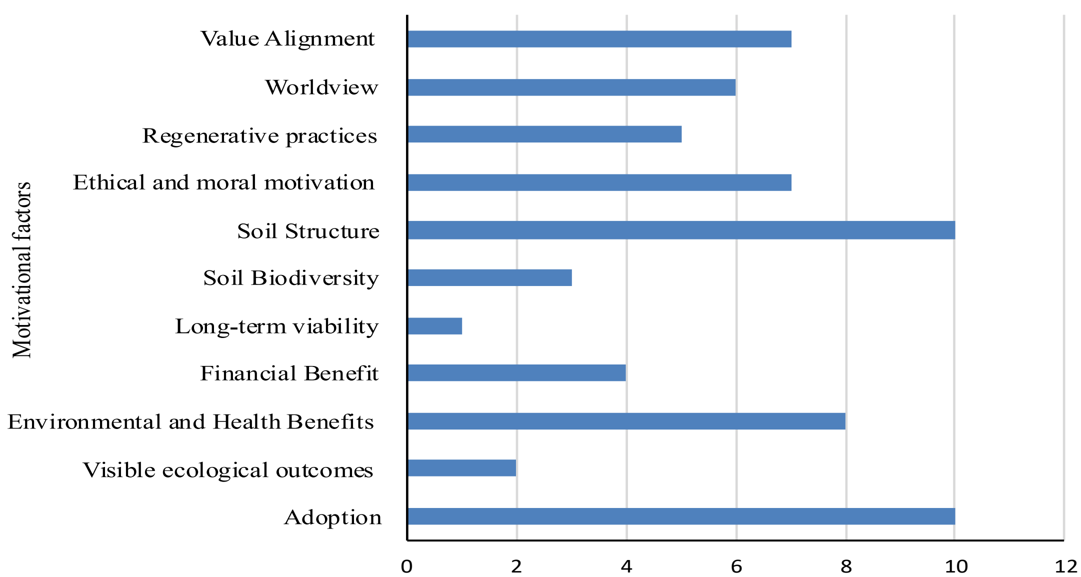
Other ethical and moral considerations motivated OF respondents. Many respondents (n=7) reported moral uneasiness about the use of conventional agrochemicals. One respondent explained: *Why would I want to put poison into the earth?"* (OF-05). Other respondents regarded organic farming as "*doing the right thing…*and it *has to come from the heart"*. (OF-08).

These findings suggest that personal values and motivations to nurture the environment are strong motivations for organic agriculture adoption. Most respondents said organic farming aligns with their ecological views and the goal of sustainable land management. This differs from the dominant economic and risk-aversion motivations of CF respondents.

Per the Diffusion of Innovation model, these observations underscore value compatibility. When innovations align with people's values and priorities, they are more likely to be adopted and sustained over the long term (Rogers, 2003). In this research, organic agriculture was viewed by many organic farmers not only as a production method but also as a means of responsible land management that supports ecological integrity and environmental sustainability. It is an expression of their environmental ethos.

With respect to Social-Ecological Systems, motivations for organic farming include the impact of farmers' values on ecological resources and how they relate to them. OF respondents tended to frame farming in the context of ecological stewardship rather than as a business model, as did CF respondents. The former view promotes a management approach that focuses on the health of soil, biodiversity, and long-term ecosystem integrity. As such, these results indicate that promoting the adoption of organic farming among conventional farmers may need to emphasize financial opportunities alongside environmental stewardship. This is not to say that environmental stewardship, ecological education, and long-term sustainability programs cannot also be effective in promoting the adoption of organic farming methods by conventional farmers who purport to share these values.

Figure 4.3 *Motivations and Perceived Benefits, and Long-Term Viability Themes Among Organic Farmers*



4.6 Challenges Encountered by Organic Farmers in Sustaining Organic Farming (RQ4)

Despite a steadfast commitment to their production systems, OF respondents noted challenges to the continued practice of organic farming, which, notably, substantially mirrored apprehensions to the adoption of organic farming by CF respondents (Figure 4.4). These challenges include:

- Limited market access (n=9)
- Certification (n=8)
- Labour costs (n=4)
- Limited extension supports specific to organic farming (n=6)

The most commonly noted challenge was market access. Nine of the respondents noted that maintaining organic product production is crucial to securing stable, profitable markets. Most were heavily dependent on direct marketing schemes, such as farmers' markets, local food stores, restaurants and community-supported agriculture programs. One respondent explained: *"We sell at the farmer's market, we wholesale to restaurants, we also sell to our local natural food store"* (OF-01).

This potentially high demand in markets offers an opportunity to earn price premiums: "…our customers love it. They seek us out. They go out of their way to buy our products" (OF-03), and that *"people just flock… and just want to buy it"* (OF-05). Some OF respondents, however, noted that relying on niche markets may also expose them to financial risk due to potential fluctuations in demand. Regardless of product demand, CF respondents (n=7) raised concerns about profitability and the high costs of market access and production. Although organic markets offer financial opportunities to many farmers, respondents cited persistent economic pressure. One stated that organic farming is still risky because *"…the cost of inputs is very high, and the return is not enough" (OF-02)*. Some emphasized that it is necessary to find customers for organic farm products who are willing to pay a premium price. One respondent explained, "*We have to access a customer base that is willing to pay more for our products"*

(OF-06). Another respondent noted that the *"organic label certainly gives us an edge in the local market"* (OF-07).

The need for certification was also reported as a major problem, especially during the initial stages of farm development. According to the farmers, the certification process involves extensive record-keeping, documentation, and compliance: *"I found the organic certification process at the beginning quite onerous"* (OF-10) But, according to another respondent, certification is required to access most direct markets: *"Certification is non-negotiable for selling to local health food stores, high-end resort restaurants, and certain Vancouver wholesalers we ship to"* (OF-09).

Another key challenge cited was labour availability. OF respondents claimed that activities such as mechanical weed control and diversification of production systems entail high labour requirements. One respondent reported, "*Labour is the main difficulty; I have to hire people every year*" (OF-08).

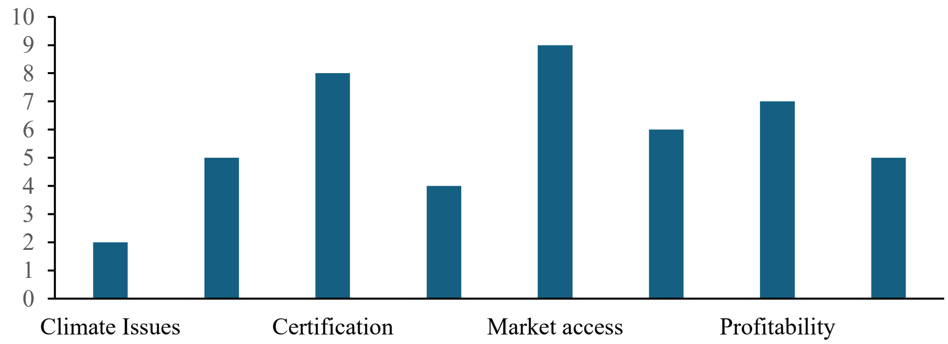
Additionally, some respondents (n=6) noted limited extension support specific to organic farming. One stated categorically that *"There is nobody. There is no support"* (OF-08). According to another OF respondent, *"They* [government] *are more of just a pain in the neck because they want statistics, like how many pounds you grew"* (OF-05). Some OF respondents drew specific comparisons between extension support in Canada and in the United States, noting that the latter is much more advanced in this area. One respondent expressed frustration about how there is never any organic-specific expertise, noting that: *"I am always envious of the extension services that are available in the U.S… specifically with regards to dealing with pests in organic settings"* (OF-07). One respondent noted the need for localized research and advisory services, saying, *"The biggest lack is regional-specific extension for biological controls… not just generic guides"* (OF-09).

The challenges faced by respondents underscore the critical role of institutional and market support structures in the long-term sustainability of organic agriculture (and, ostensibly, its adoption). Many organic farmers seem to be strongly motivated to use organic methods by an environmental stewardship ethos and an individual value system. However, to sustain their preferred farming system in the long run, they need access to stable markets, dependable workers, and institutional support structures.

According to the Diffusion of Innovations model, sustained utilization is not only a function of the initial adoption decision but also of a long-term confirmation process in which adopters assess whether the innovation is indeed beneficial and feasible. Persistent economic or operational difficulties can impede the continued use of innovation. Through a Social-Ecological Systems lens, these issues manifest as interactions among actors, governance systems, and market structures. The certification agencies, policy initiatives, and market institutions thus become critical factors shaping the conditions under which organic farming can survive, let alone thrive. Among the OF respondents interviewed, a majority (n=6) pointed out that the institutionalized support systems in place, in most cases, fail to address the needs of organic farmers.

These findings suggest that sustainability in organic agriculture adoption can be improved by strengthening organic-specific extension services and technical assistance, increasing the availability of skilled labour, and creating stable market opportunities for organic farm products, such as institutional procurement initiatives (Grube-Cavers et al., 2018)

Figure 4.4 *Challenges faced by organic farmers in sustaining their practices.*



4.7 Institutional Support and Knowledge Systems (RQ4)

OF, CF, and AP respondents identified several types of institutional support that impact the adoption and continuation of organic agriculture (Table 4.4). These include:

- Certification bodies: OF (n=8), CF (n= 3), AP (n=3)
- Extension services: OF (n=6), CF (n= 3), AP (n=8)
- Peer networks. OF (n=8), CF (n= 8), AP (n=7)

For OF respondents (n = 8). peer networks, is widely relied upon as a source of useful information on organic practices, especially for crop management, pest control, and soil health management. One respondent stated, *"Crucial. If it were not for the people that I had learned from, I would not be doing this"* (OF-03). Another shared: *"Other organic farmers have shown me so much, the way they do it… otherwise it would have been really hard"* (OF-05).

In addition to informal learning, organic farmers also emphasized the value of institutional forms of networking, such as joining sector organizations and cooperatives. One noted, *"I was on the board of COABC* [Certified Organic Associations of British Columbia] *... and really built connections with other organic farmers"* (OF-01).

Similarly, CF respondents also emphasized the importance of networks and peer-to-peer knowledge transmission. Although in more pragmatic, production-based terms. Some of them emphasized dependence on peers with like farming conditions. One participant said, *"For the most part, the people I talk with and network with farm quite similarly to me"* (CF-06).

Others defined networking as a viable means of evaluating innovation and minimizing uncertainty. According to one farmer, "*local successful examples are the best research*" (CF-07). The criticality of peer networks was reinforced by affiliated professionals, who described their role as facilitators rather than primary sources of knowledge. One of the affiliated professionals observed that: *"The farmers are not looking to experts outside of the region; they are really looking to their peers, their neighbours who are farming"* (AF-04).

In this context, field days, workshops, and mentorship activities were seen as important spaces for strengthening farmer-to-farmer learning and local knowledge exchange. Some of the affiliated professionals also highlighted the financial and risk-mitigating benefits of networks, and one of them described it as, *"farmer networks and mentorship reduce technical risk"* (AF-09).

The findings reveal that peer-based and institutionally facilitated networks were seen as the main sources of support for both groups of farmers. If farmers learn primarily through trusted relationships, then one practical route to greater adoption of organic agriculture by conventional farmers may be to create more opportunities for direct interaction, observation, and exchange between conventional and organic producers. Such interaction may help reduce skepticism, improve the perceived credibility of organic practices, and make the transition appear more feasible within conventional farming contexts.

4.7.1 Certification as a Market Access Support to Organic Farmers

Certification bodies were also found to be important institutional actors, as they ensure adherence to organic standards, which provides credibility in organic markets. Many respondents (n=8) cited that certification is necessary to reach more valuable buyers and reliably secure premium prices. One of the OF respondents said, *"The benefit is the marketing aspect of it. We get a better price for our product"* (OF-02). While another emphasized expanded market access with certification, noting that *"The benefit is I can sell to bigger companies now and at a higher price"* (OF-03).

Conversely, conventional farmers usually perceived the move towards organic production and the certification process as limiting. According to one respondent, the adoption of organic practices was not deemed advantageous because it *"…would have been too much change to our operations to get certified as organic farmers*" (CF-02).

Affiliated professionals noted that certification-related programs offer some practical assistance, especially in reducing the direct costs of certification. However, such programs were seen as narrowly focused, addressing only one barrier among the broader set of financial and structural challenges associated with organic farming. As one affiliated professional explained, *"There is the Organic Certification Assistance Program, which helps offset the cost of certification. Then, there is the Environmental Farm Plan (EFP), …the Certification Programs address a specific barrier"* (AF-07). This suggests that current certification support measures tend to address a single cost rather than the broader economic risks that may discourage farmers from transitioning to organic agriculture.

4.7.2 Role of Extension Services in Agricultural Knowledge Development Dissemination

Eight AP respondents indicated they were involved in providing agricultural extension programmes. However, few organic or conventional farmers cite them as significant sources of new knowledge. This indicates that their institutions position themselves, at best, as knowledge brokers rather than new knowledge creators (a primary function of extension). Regardless, most respondents emphatically reported limited access to formal extension services, often characterizing such institutional support as nonexistent or wholly inadequate to their needs. One organic farmer indicated that: *"Most of our help, or training, or whatever, seems to come from local farmers"* (OF-04). Others expressed frustration that institutional engagement is merely administrative rather than technically supportive. The necessity of regional-specific expertise was also noted by another farmer who said, *"The biggest lack is regional-specific extension for biological controls… not just generic guides"* (OF-09).

In comparison, conventional farmers tend to rely on formal organizations as reliable sources of information, particularly universities and regulatory bodies. One respondent said, "*I usually get my information from university extension programs*" (CF-01), while another cited *"fact-based stuff through Canadian Food Inspection Agency [CFIA], federal government"* (CF-04).

Although most CF respondents reported relying on extension programs, industry associations, and technical advisors, not all viewed this support as adequate, as one respondent noted, "*I think it boils down to a lack of support and a lack of information"* (CF-08).
AP respondents, however, emphasized their role in providing technical advice, decision-support tools, on-farm research, and other knowledge-sharing resources.

The study findings indicate that knowledge networks and institutional systems are central in promoting the adoption and sustainability of organic agriculture. While formal agricultural institution programming can play a vital role in regulation and policy, most British Columbia farmers seem to rely on informal farmer networks for practical knowledge and problem-solving. This pattern may partly reflect the limited reach, accessibility, or perceived effectiveness of formal extension services in British Columbia, leading farmers to depend more heavily on peer-based and community-rooted sources of support. From the Social-Ecological Systems perspective, this highlights the intersection between the governance systems and actors by showing how the availability, accessibility, and perceived effectiveness of formal institutional support influence the ways farmers seek, trust and use knowledge.

The findings demonstrate how institutional frameworks, including certification organizations and extension programs, shape the regulatory environment of organic agriculture. In contrast, practical knowledge among farmers is developed through day-to-day farm management and sharing. In line with the Diffusion of Innovation framework, farmer networks are important communication channels through which information about agricultural innovations spreads. These results indicate that enhancing the diffusion of organic agriculture in British Columbia through stronger knowledge networks among farmers and stronger organic-specific extension services is a viable path to increasing adoption and the near- and long-term sustainability of organic farming.

Table 4.3 *Perceived Institutional Support Among Respondents*

Support Systems	**Certified Organic Farmer**	**Conventional Farmer**	**Affiliated professionals**
Certification	8	3	3
Policies	0	3	3
Resource access	1	0	1
Institutional networks	8	8	7
Extension Services	6	3	8
Financial Support	3	7	4
Training	2	5	9

4.8 Synthesis of Findings through the Diffusion of Innovation and Social-Ecological Systems Frameworks

The Diffusion of Innovation theory and the Social-Ecological Systems framework together help explain the limited adoption of organic agriculture in British Columbia. Taken as a whole, the findings suggest that low adoption cannot be explained by awareness alone, but rather by differences in how farmers assess the practicality, compatibility, and perceived risks of organic farming within their own circumstances. Conventional farmers were generally aware of organic agriculture, yet many regarded it as poorly aligned with the scale, labour demands, pest-management systems, and economic realities of their existing operations. Organic farmers, by contrast, were more likely to view organic farming as consistent with their environmental values, farming philosophy, and preferred approach to stewardship and wholesome production. This contrast reflects earlier adoption research indicating that farmers do not adopt organic agriculture simply because they are aware of it, but because they regard it as viable, meaningful, and workable within their own production context (Padel, 2001; Cranfield et al., 2009).

From a Diffusion of Innovation perspective, this pattern can be understood through the concepts of compatibility, complexity, observability, and relative advantage (Rogers, 2003). Organic agriculture was more attractive to respondents who saw it as aligned with their values and who could observe tangible ecological or market benefits. It was less attractive to respondents who saw it as too disruptive to existing infrastructure, labour arrangements, production systems, and economic stability. In this sense, many conventional farmers appeared to remain at the stages of knowledge and persuasion rather than moving fully into decision and implementation, because the transition was still perceived as too risky or impractical. This aligns with previous studies showing that concerns about transition risk, labour burden, technical uncertainty, and certification can significantly slow adoption, even where interest in ecological farming exists (Prokopy et al., 2008).

The Social-Ecological Systems framework complements this explanation by revealing that these perceptions do not emerge in isolation, but within broader interactions among actors, governance arrangements, support systems, and resource conditions (Ostrom, 2009). Farmers' decisions were shaped not only by personal beliefs and farm-level realities, but also by certification requirements, market opportunities, labour availability, extension services, and the strength or weakness of institutional support. In particular, the findings suggest that organic farmers' heavy reliance on peer networks and informal learning may partly reflect the limited reach or visibility of formal, organic-specific extension support in British Columbia. This is consistent with earlier studies showing that farmer-to-farmer knowledge exchange becomes especially important where formal technical support for organic transition is weak or uneven (Kroma, 2006). Viewed through an SES lens, adoption and long-term sustainability are therefore shaped by the interaction between individual actors and the wider governance and support environment in which they operate.

Taken together, DOI and SES show that organic agriculture adoption in British Columbia is both a farmer-level decision process and a system-shaped outcome. Awareness matters, but awareness alone is insufficient where organic agriculture is perceived as incompatible with existing operations or unsupported by the wider institutional environment. More meaningful change will therefore require more than awareness-raising. It will require reducing transition risk, improving organic-specific extension and technical support, strengthening farmer-led knowledge exchange, and addressing the broader market and policy conditions that determine whether organic farming is seen as realistic and worthwhile. In this regard, the findings reinforce the broader argument of this thesis: that adoption of organic agriculture in British Columbia depends not only on farmers' motivation but also on whether the surrounding socio-ecological and institutional systems make adoption feasible and sustainable.

4.9 Findings in Relation to Previous Studies

The findings of this study are broadly consistent with previous research on the adoption of organic agriculture. One clear pattern is that awareness alone does not necessarily lead to adoption. Although most conventional farmers in this study were familiar with organic agriculture, their knowledge was often informal, socially mediated, and observational rather than technical or institutionally supported. This aligns with diffusion-based adoption studies, which suggest that innovations are more likely to be adopted when they are visible, credible in the local context, and communicated through trusted social networks (Rogers, 2003; Kroma, 2006; Prokopy et al., 2008). It also supports earlier research showing that peer influence and knowledge transfer are especially important where formal extension systems are weak or where neighbouring farmers serve as major sources of practical knowledge (Padel, 2001).

The barriers identified in this study are also consistent with earlier findings in the literature. Conventional farmers repeatedly referred to financial risk during transition, market uncertainty, labour intensity, and production-related concerns such as weed, pest, and disease management. Similar barriers have been identified in previous studies, including certification requirements, uncertainty of returns during the transition period, variable yields, and the practical demands of organic farming (Cranfield et al., 2010; Knowler & Bradshaw, 2007). This study contributes to that literature by showing that these concerns remain highly relevant in the British Columbia context, where farmers assess organic agriculture in relation to farm scale, production realities, and financial sustainability.

The motivations for adoption identified in this study likewise support earlier research showing that organic farming decisions are often strongly value-based. Ethical concerns, environmental responsibility, and commitment to soil health and biodiversity were important drivers among organic farmers. These findings are consistent with studies showing that farmers are more likely to adopt organic agriculture when they hold strong ecological values, longer-term stewardship goals, and concerns about the environmental impacts of synthetic inputs (Carlisle, 2016; Reganold & Wachter, 2016). The findings therefore reinforce the view that organic agriculture is not only a technical production system, but also a value-oriented approach to farming. In this respect, the study also supports the argument that organic agriculture can serve as a practical route toward regenerative agriculture goals, particularly those related to soil health, ecological resilience, and reduced dependence on synthetic inputs (Schreefel et al., 2020; Altieri et al., 2017).

The findings on institutional support are also consistent with previous studies highlighting the importance of policy, certification, extension services, and farmer networks in shaping adoption. Both conventional and organic respondents emphasized the importance of peer learning, farmer-to-farmer support, and trusted networks, while also pointing to the limited or uneven role of formal extension services in supporting organic agriculture. This is consistent with research showing that access to practical knowledge, technical assistance, and institutional arrangements that reduce uncertainty can play a significant role in encouraging adoption (Van der Ploeg et al., 2012). In the British Columbia context, these findings suggest that reliance on informal support networks may partly reflect the limited visibility or reach of formal organic-specific extension and transition support systems.

Thus, these findings show that the British Columbia case reflects many of the same drivers and barriers identified in earlier studies, while also highlighting the importance of local institutional and market conditions. In this sense, the study contributes to existing scholarship by showing how familiar adoption challenges are shaped by the particular realities of British Columbia's agricultural context and by reinforcing the need to understand adoption as both a farmer-level and system-level process.

5. Conclusion and Recommendations

5.1 Summary of Findings and Recommendations

This study set out to examine awareness, adoption, and sustainability of organic agriculture among farmers in British Columbia, using the Diffusion of Innovation and Social-Ecological Systems frameworks. The following section synthesizes and presents the study's main results, which inform a series of recommendations.

First, while awareness of organic agriculture among conventional farmers was relatively high, awareness alone was insufficient to prompt transition. Farmers regarded organic agriculture primarily in terms of its perceived compatibility with their existing farming systems, observable success among peers, and anticipated economic feasibility. This strongly suggests that efforts aimed solely at awareness-raising are unlikely to drive adoption. Instead, recommendations should prioritize facilitating the visible, viable adoption of organic practices at a comparable scale, particularly through demonstration farms, peer-led trials, and regionally relevant case examples. Concomitantly, a policy regime that supports the adoption of organic practices must be created.

Second, the transition to organic agriculture was constrained by a convergence of economic, technical, and institutional barriers, with the transition period posing the greatest risk. Financial exposure during certification, uncertainty of market access, and increased labour demands discouraged adoption. These findings point to the need for targeted transition-stage interventions, including income-stabilization mechanisms, transitional financial support, and risk-sharing instruments that specifically address the certification lag period.

Third, organic adoption among certified organic farmers was driven largely by values-based motivations rather than incremental experimentation. Adoption decisions were often decisive and, over time, reinforced by realized benefits such as improved soil health, ecological resilience, and personal gratification. This suggests that policy frameworks should recognize organic agriculture not merely as a technical system, but as a values-aligned livelihood strategy, and avoid a one-size-fits-all adoption model that assumes a gradual conversion pathway.

Finally, sustaining organic practices depended heavily on informal support systems, particularly farmer-to-farmer networks. In contrast, formal institutional support, especially extension services, was perceived as limited or, at best, poorly adapted to organic contexts. This highlights the importance of strengthening locally grounded, organic-specific extension and knowledge creation (applied research) and sharing (extension programming) structures that formally integrate peer learning rather than regarding the latter as sufficient.

Taken together, these findings indicate that effective support for organic agriculture must extend beyond awareness and regulation, and instead focus on reducing transition risk, improving institutional responsiveness and support, and leveraging existing social and knowledge networks.

5.2 Practical Recommendations

The findings of this study point to several practical priorities for provincial government agencies, extension providers, certification bodies, and agricultural organizations to increase adoption of organic agriculture in British Columbia and support its long-term sustainability. For the provincial government, a key priority is strengthening transition support mechanisms to reduce the risks associated with the certification period. In British Columbia, this could build on existing sustainability-oriented mechanisms such as the Environmental Farm Plan (EFP) Program and the Beneficial Management Practices (BMP) Program, which already support on-farm environmental planning and cost-shared improvements but are not specifically designed to meet organic transition needs. Strengthening these programs to include more explicit organic transition components, such as certification assistance, transition grants, and income stabilization supports, would make transition more feasible for farmers interested in moving into certified organic production. The government also has a role in strengthening organic-specific extension and technical support. Although the BC Ministry of Agriculture and Food has increasingly emphasized sustainability, regenerative agriculture, and agritech through its strategic framework, the findings of this study suggest that more direct and visible support for organic transition is still needed. This could include regionally tailored advisory services, organic transition specialists, and stronger integration of organic-specific technical guidance within existing sustainability and climate-oriented agricultural support structures.

For extension providers and agricultural support organizations, the findings suggest a need to expand context-specific technical support tailored to organic farming conditions in British Columbia. Strengthening on-farm advisory services, demonstration opportunities, and regionally relevant training may reduce perceived complexity and improve farmers' capacity to adopt and sustain organic practices. Existing sector organizations, such as Organic BC, already provide education, events, certification resources, workshops, field days, and the BC Organic Conference, and these platforms could be further supported and expanded as part of a wider provincial organic knowledge strategy. Agricultural associations and farmer-based organizations can also play an important role in facilitating mentorship, farmer-to-farmer learning, and cooperative knowledge exchange, especially where formal extension remains limited.

For certification bodies, the findings underscore the need to make the certification process more supportive and accessible while maintaining organic standards. In British Columbia, this recommendation applies directly to the existing certification landscape under the BC Certified Organic Program and the Canada Organic Regime, including bodies such as Organic BC, PACS, and FVOPA. Streamlining administrative requirements, improving communication with farmers, and offering clearer guidance during the transition period may reduce perceived institutional burden and make certification more manageable, particularly for smaller and medium-scale producers.

Finally, stronger collaboration across all these bodies is needed to support farmer networks and cooperative learning structures. Policies and programs that build on existing social capital within farming communities may strengthen both adoption and long-term sustainability of organic agriculture in British Columbia. In practical terms, this means not only improving formal institutional mechanisms but also investing in farmer-to-farmer and community-based knowledge systems, which many participants in this study identified as central to adoption and continuity. Taken together, these recommendations suggest that British Columbia does not necessarily lack all relevant support mechanisms, but that existing mechanisms need to be better aligned, more organic-specific, and more clearly connected to the realities of transition and long-term practice.

5.3 Contributions to Knowledge

This study contributes to scholarship on the adoption of organic agriculture in three main ways. First, it provides context-specific empirical insight into the adoption of organic agriculture in British Columbia by comparing the perspectives of conventional farmers, certified organic farmers, and affiliated professionals. In doing so, it shows that awareness of organic agriculture does not necessarily translate into adoption, and that a combination of perceived risk, labour demands, market uncertainty, environmental values, and institutional support conditions shapes adoption decisions.

Second, the study makes a theoretical contribution by demonstrating the value of integrating the Diffusion of Innovations and Social-Ecological Systems frameworks for analyzing agricultural change. The Diffusion of Innovation framework helps explain how farmers assess organic agriculture in terms of compatibility, complexity, observability, and relative advantage. In contrast, the Social-Ecological Systems framework helps explain how governance arrangements, support systems, actors, and market conditions shape the feasibility and sustainability of adoption. Taken together, these frameworks show that adoption cannot be understood solely as an individual decision but must also be interpreted in relation to wider socio-ecological and institutional structures. While earlier studies, such as Padel (2001), made an important contribution by showing that organic farming decisions are shaped by multiple interacting factors rather than by economics alone, the present study extends that insight by explicitly combining a farmer-level adoption framework with a systems-level analytical framework. In doing so, it provides a more integrated explanation of how individual perceptions, social learning, institutional conditions, and wider governance structures interact to shape the adoption and long-term sustainability of organic agriculture in British Columbia.

Third, although grounded in the context of British Columbia, the study contributes more broadly to research on organic agriculture transitions by showing how farmer-level decision-making and wider structural conditions interact to shape both uptake and long-term viability. In this respect, the study reinforces the argument that transitions toward organic agriculture depend not only on farmers' awareness or motivation but also on practical support systems that reduce uncertainty and make adoption more feasible. The findings, therefore, contribute to broader scholarship on agricultural sustainability transitions and support the view that organic agriculture can serve as a practical and established pathway toward regenerative agriculture goals.

5.4 Limitations of the Study

Three main limitations were identified in this study. First, the number of participants was relatively small, comprising a qualitative sample of 30 conventional farmers, certified organic farmers, and affiliated agricultural professionals in British Columbia. While the sample provided sufficient depth and diversity of perspectives for qualitative analysis, the findings are not intended to be statistically representative of all farmers or all agricultural professionals in the province.

Second, although participants were drawn from different agricultural areas of British Columbia, not all regions of the province were equally represented. Farmers' experiences and perspectives on the adoption of organic agriculture are likely to vary across BC because agricultural systems, environmental conditions, market access, and institutional support structures differ considerably by region. In addition, differences in farm size and years of farming experience across participants may also have influenced how respondents understood the opportunities, risks, and practicality of organic agriculture.

Third, the study relied primarily on self-reported experiences, perceptions, and reflections gathered through semi-structured interviews. As in other qualitative research, participant responses may have been influenced by memory, personal interpretation, subjective experience, or social desirability. The findings, therefore, reflect how participants understood and described their own situations, and do not necessarily represent independently verified farm performance or actual adoption outcomes.

5.5 Recommendations for Future Research

Future research could build on this study by further applying and refining the combined use of the Diffusion of Innovations and Social-Ecological Systems frameworks to analyze organic agriculture adoption. Quantitative or mixed-methods studies could, on a broader scale, examine whether Diffusion of Innovation-related factors, such as perceived compatibility, observability, trialability, complexity, and relative advantage, are consistently associated with adoption intentions and behaviours across different farming populations. At the same time, future studies could apply the Social-Ecological Systems framework more systematically to examine how governance arrangements, market structures, extension services, certification systems, and farmer networks interact to enable or constrain the adoption of organic agriculture.

Longitudinal research would also be valuable in tracing how farmers' perceptions, motivations, support needs, and institutional conditions change over time, particularly during the transition to organic farming and the maintenance of certification. Such research could provide deeper insight into how adoption decisions evolve, how barriers shift across stages of transition, and what kinds of support are most important at different points in the process. Comparative studies across provinces or regions would also be useful in assessing how different policy and institutional contexts shape adoption, thereby extending the usefulness of the combined DOI-SES approach beyond British Columbia.

In addition, future research could more directly explore the relationship between organic agriculture and regenerative agriculture in practice. This could include examining how farmers themselves understand regenerative agriculture, whether organic certification supports or limits regenerative goals, and how organic and regenerative approaches compare across different agricultural settings. Such work would help clarify how organic agriculture functions not only as a certified production system, but also as a possible pathway toward broader regenerative agriculture objectives.

Although this study included both conventional and organic farmers, the perspectives of organic farmers were explored in greater depth because of the study's focus on adoption and long-term sustainability. As a result, some dimensions of conventional farmers' perspectives may not have been fully examined. Future research could therefore look more closely at how conventional farmers understand organic transition, what forms of support they consider most credible, and how their perceptions change over time. A longer-term and larger-scale study could provide a more detailed understanding of how motivations, barriers, and adoption decisions evolve, especially during the transition period toward organic certification.

5.6 Conclusion

This study demonstrates that the interaction between farmer agency and wider systemic conditions shapes the adoption and long-term sustainability of organic agriculture in British

Columbia. While individual motivations, values, and perceptions remain important, they are not sufficient on their own to ensure adoption. Supportive institutional structures, practical knowledge systems, market conditions, and policy environments are equally necessary to make the transition and long-term practice feasible. The findings also reinforce the relevance of organic agriculture within broader discussions of regenerative agriculture and sustainable food systems. Across the study, soil health, ecological stewardship, biodiversity, and reduced dependence on synthetic inputs were repeatedly identified as important motivations for adopting and maintaining organic farming. In this respect, the study suggests that organic agriculture can serve not only as an alternative production system but also as a practical, established pathway toward regenerative agriculture goals, particularly those related to ecological resilience, environmental sustainability, and the long-term health of agroecosystems.

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Appendix A

Case Classification Sheet

Respondent Type	Gender	Group	Farming Experience	Location	Key Challenges	Primary Motivation	Transition Type	Farm Scale
OF-01	Female	Certified Organic Farmer	Medium-term	Vancouver Island	Cost/Profitability	Health/Ethics/Values	Transitioned	Small
OF-02	Male	Certified Organic Farmer	Medium-term	Comox Valley	Pests/Disease	Lifestyle/Challenge	Immediate start	Large
OF-03	Female	Certified Organic Farmer	Short-term	Courtenay	Cost/Profitability	Health/Ethics/Values	Immediate start	Small
OF-04	Male	Certified Organic Farmer	Short-term	Kootenays	Equipment	Financial/Niche Access	Immediate start	Small
OF-05	Male	Certified Organic Farmer	Long-term	Okanagan	Land Ownership/Structural	Health/Ethics/Values	Immediate start	Small

OF-06	Male	Certified Organic Farmer	Medium-term	Thompson Nicola	Pests/Disease	Financial/Niche Access	Immediate start	Small
OF-07	Male	Certified Organic Farmer	Short-term	Vancouver Island	Cost/Profitability	Financial/Niche Access	Immediate start	Small
OF-08	Male	Certified Organic Farmer	Medium-term	Kootenays	Cost/Profitability	Health/Ethics/Values	Immediate start	Small
OF-09	Male	Certified Organic Farmer	Short-term	Vancouver Island	Cost/Profitability	Financial/Niche Access	Immediate start	Small
OF-10	Male	Certified Organic Farmer	Long-term	Fraser Valley	Pests/Disease	Financial/Niche Access	Transitioned	Large
CF-01	Female	Conventional Farmer	Long-term	Vancouver Island	Labour	Conventional Efficiency	N/A	Small
CF-02	Male	Conventional Farmer	Long-term	Fraser Valley	Regulatory Compliance	Established Setup	N/A	Large
CF-03	Male	Conventional Farmer	N/A	Fraser Valley	Cost/Profitability	Established Setup	N/A	Large

CF-04	Male	Conventional Farmer	Medium-term	Comox Valley	Cost/Profitability	Conventional Efficiency	N/A	Small
CF-05	Male	Conventional Farmer	Medium-term	Fraser Valley	Transition Risk	Financial/Niche Access	N/A	Large
CF-06	Male	Conventional Farmer	Long-term	Fraser Valley	Cost/Profitability	Financial/Niche Access	N/A	Large
CF-07	Male	Conventional Farmer	Medium-term	Okanagan	Transition Risk	Financial/Niche Access	N/A	Large
CF-08	Male	Conventional Farmer	Short-term	Vancouver Island	Labour	Financial/Niche Access	N/A	Small
CF-09	Male	Conventional Farmer	Long-term	Fraser Valley	Cost/Profitability	Financial/Niche Access	N/A	Large
CF-10	Male	Conventional Farmer	Medium-term	Okanagan	Transition Risk	Financial/Niche Access	N/A	Large
AP-01	N/A	Stakeholder	N/A	Fraser Valley	N/A	N/A	N/A	N/A
AP-02	N/A	Stakeholder	N/A	Providence-wide	N/A	N/A	N/A	N/A
AP-03	Female	Stakeholder	N/A	Providence-wide	N/A	N/A	N/A	N/A
AP-04	Female	Stakeholder	N/A	Kootenays	N/A	N/A	N/A	N/A

AP-05	Female	Stakeholder	N/A	Vancouver Island	N/A	N/A	N/A	N/A
AP-06	Female	Stakeholder	N/A	Providence-wide	N/A	N/A	N/A	N/A
AP-07	N/A	Stakeholder	N/A	Providence-wide	N/A	N/A	N/A	N/A
AP-08	N/A	Stakeholder	N/A	Fraser Valley	N/A	N/A	N/A	N/A
AP-09	N/A	Stakeholder	N/A	Providence-wide	N/A	N/A	N/A	N/A
AP-10	N/A	Stakeholder	N/A	Okanagan	N/A	N/A	N/A	N/A

Appendix B

Interview Guide: Organic Farmers

Study Title: Adopting Organic Agriculture as an Established Pathway to Regenerative Agriculture in British Columbia

Researcher: Yussuf Olalekan Adedeji

Supervisor: Dr. Kent Mullinix

Institution: Royal Roads University

Section 1: Background and Motivation

1. Can you tell me about your farm size, products, and how long you have been operating organically?

2. Did you transition to organic agriculture or start farming with organic methods?

3. What motivated you to adopt organic farming methods?

4. Were there key moments, influences, or role models that shaped your decision?

5. How did you first learn about organic agriculture, and what was your initial impression?

6. Was your transition gradual or immediate? What influenced the pace of your transition?

Section 2: Adoption Experience and Observed Benefits

1. What have been the most significant benefits you have experienced since adopting organic practices?

2. How has organic farming affected soil health, productivity, and profitability?

3. In what ways do you feel more resilient or vulnerable since transitioning or since practicing?

4. How do your customers respond to organic products compared to conventional ones?

5. In your opinion, how does organic farming align with or contribute to regenerative agriculture? Do you see organic practices as a path toward regeneration, or do you Distinguish between the two?

Section 3: Challenges and Barriers

10. What were the major challenges you encountered during the transition period?

11. Are there any ongoing technical, financial, or labour-related difficulties you face?

12. How have you adapted your practices or business model to overcome these challenges?

Section 4: Institutional and Market Support

13. What types of support (e.g., training, financial aid, marketing) have you received from government or private institutions?

14. How helpful were these forms of support in your journey?

15. Are there areas where support has been lacking or ineffective?

16. What has been your experience with organic certification cost, bureaucracy, and benefit?

Section 5: Community and Network Influence

17. How important have farmer networks, cooperatives, or mentorships been to your success?

18. Do you share your knowledge with conventional farmers? If so, how?

19. What impact do you think local consumer demand has on your operations?

Section 6: Reflections and Outlook

20. What would make it easier for other farmers to adopt organic practices?

21. How do you see organic agriculture evolving in British Columbia over the next

decade?

22. What policy recommendations would you make to support more organic transitions?

23. What advice would you offer to a conventional farmer curious about organic farming methods?

Appendix C

Interview Guide: Conventional Farmers

Section 1: Background and Current Practices

1. Can you describe your farm, size, products, and how long you have been farming?
2. What farming methods do you currently use, and why do you prefer these methods?
3. Have you ever tried any organic practices, even on a small scale? If yes, what was the experience like?

Section 2: Awareness and Perception of Organic Farming

1. How familiar are you with organic farming and its principles?
2. What is your general opinion of organic agriculture as a farming model?
3. Do you know other farmers who practice organic methods? Have you ever talked to them about it?
4. Have you heard of regenerative agriculture? How do you think it compares to or relates to organic farming? Do you see a connection between the two?

Section 3: Barriers to Adoption

1. Have you ever considered transitioning to organic farming? Why or why not?
2. What are the main concerns or risks that discourage you from making the switch?
3. Are there specific technical, financial, or market-related barriers that you see as major obstacles?

4. What role does certification play in your hesitation, cost, process, or paperwork?

Section 4: Market and Institutional Influence

1. Do you think there is enough consumer demand or reliable markets for organic products?
2. Would more government or corporate support for organic market development influence your decision? (e.g., subsidies, contract buying)
3. Are you aware of any government or non-profit programs that help farmers transition to organic? Have you ever considered them?

Section 5: Support Systems and Influence

1. What kind of support (training, mentorship, financial aid) would make you more open to trying organic methods?
2. Who or what influences your farming decisions the most: family, advisors, neighbouring farmers, or associations?
3. Would you be willing to try organic methods on a trial basis if risks were minimized? What conditions would you need?

Section 6: Reflection and Future Outlook

1. What advice would you give policymakers or organizations trying to support sustainable transitions?
2. How do you see the future of agriculture in British Columbia?
3. If organic farming became more profitable or less risky, would you reconsider?
4. Do you have any other thoughts or questions about organic agriculture you would like to share?

Appendix D

Interview Guide: Government and Organizational Stakeholders

Section 1: Organizational Role and Scope

1. Can you describe your organization's mandate and role in supporting agriculture in British Columbia?

2. How does your organization engage with conventional and organic farmers?

3. Does your office have any programs specifically targeted at supporting organic agriculture or reducing chemical input reliance?

Section 2: Policies and Institutional Support

4. What policies or programs currently exist to encourage the adoption of organic agriculture?

5. In your experience, how effective have these policies been in encouraging transitions?

6. What are the most common barriers farmers report when considering organic farming?

7. Are there any unintended consequences or gaps in policy that limit organic adoption?

Section 3: Capacity Building and Resources

8. What kind of technical support, training, or extension services does your organization offer to farmers considering organic methods?

9. Are there mentorship programs, demo farms, or field schools available to help farmers build confidence?

10. Do farmers express interest in these programs, or is uptake generally low?

Section 4: Market and Economic Influences

11. What role do you believe market access and consumer demand play in shaping farmers' decisions to go organic?

12. Have there been any coordinated efforts between your organization and buyers? processors, or retailers, to build the organic market?

13. Do you believe more direct government or corporate investment in organic marketing would influence farmer transitions?

Section 5: Collaboration and Networking

14. Does your organization collaborate with other agencies, academic institutions, or NGOs to promote organic farming?

15. How important are farmer networks, cooperatives, or regional food initiatives in supporting transition efforts?

16. What lessons have you learned from successful (or failed) support programs?

Section 6: Future Directions and Recommendations

17. What do you think is the most urgent change needed to support more organic adoption?

18. Are there policy tools you believe are underutilized or misaligned with the needs of transitioning farmers?

19. What metrics or feedback mechanisms does your organization use to evaluate impact?

20. Does your organization make a distinction between organic farming and regenerative agriculture in its policies or programs? How do you see their relationship in shaping the future of agriculture?

21. From your perspective, what role will organic agriculture play in the future of British Columbia's food system?

Appendix E

Codebook Used for Analysis of Interview Data

Theme	**Code**	**Description**	**Analytical basis**
Farming background and current practices	Farm background	Participant description of farm type, scale, products, and years of experience	Interview guides / descriptive
Farming background and current practices	Current farming practices	Current production methods and management practices used on the farm	Interview guides / descriptive
Farming background and current practices	Farming goals and outlook	Participants' definition of good, successful, or sustainable farming	Interview guides / inductive
Awareness and familiarity	Awareness of organic agriculture	General awareness or familiarity with organic farming and alternative practices	DOI
Awareness and familiarity	Knowledge sources	Sources through which participants learned about organic farming	DOI / SES
Awareness and familiarity	Farmer networks	Peer-to-peer learning through neighbours, friends, and farming contacts	DOI / SES

Awareness and familiarity	Expert consultation	Information received from advisors, councils, specialists, or formal institutions	DOI / SES
Awareness and familiarity	On-farm experimentation	Small-scale testing or direct experience with organic or alternative methods	DOI: Trialability
Perceptions of organic agriculture	Compatibility	Perceived fit between organic agriculture and existing farm values, scale, conditions, or methods	DOI
Perceptions of organic agriculture	Observability	Influence of seeing the results of organic practices on other farms	DOI
Perceptions of organic agriculture	Perceived viability	Beliefs about whether organic agriculture is practical, realistic, or scalable	DOI / inductive
Perceptions of organic agriculture	Knowledge gap	Perceived lack of technical understanding of organic practices	DOI / SES
Motivations for adoption	Relative advantage	Perceived ecological, health, market, or social benefits of organic agriculture	DOI

Motivations for adoption	Environmental stewardship	Adoption motivated by care for land, biodiversity, soil, and ecosystems	DOI / SES
Motivations for adoption	Soil health and biodiversity	Interest in improving soil quality, fertility, and biodiversity	SES
Motivations for adoption	Human health and food quality	Motivation linked to safer food, better quality food, or reduced chemical exposure	DOI / inductive
Motivations for adoption	Ethical and moral motivation	Values, beliefs, and moral concerns about farming practices shape adoption.	Inductive thematic analysis
Motivations for adoption	Value alignment	Alignment between organic agriculture and personal worldview or farming philosophy	Inductive thematic analysis
Barriers and constraints	Complexity	Perception that organic agriculture is difficult, technical, or demanding to implement	DOI
Barriers and constraints	Economic constraints	High costs of transition, certification, labour, equipment, or inputs	SES

Barriers and constraints	Transition risk	Financial and production risks associated with the transition period	DOI / SES
Barriers and constraints	Labour requirements	Labour intensity and workforce availability challenges	DOI / SES
Barriers and constraints	Pest, weed, and disease pressure	Production risk associated with ecological and crop protection challenges	SES
Barriers and constraints	Market uncertainty	Concern about stable demand, price premiums, and market reliability	SES
Barriers and constraints	Regulatory burden	Administrative paperwork, compliance demands, and certification requirements	SES
Barriers and constraints	Land access and tenure	Difficulty accessing land or secure tenure for organic farming	SES
Institutional and policy context	Governance systems	Role of regulations, programs, and institutional arrangements in shaping adoption	SES
Institutional and policy context	Certification	Experiences with certification cost,	SES

		bureaucracy, credibility, and benefit	
Institutional and policy context	Policy incentives and gaps	Perceived support or lack of support from policies, subsidies, or programs	SES
Institutional and policy context	Institutional support	Support received from governments, organizations, or industry programs	SES
Institutional and policy context	Extension services	Availability and usefulness of technical advice, outreach, and extension programming	SES
Institutional and policy context	Knowledge systems	Formal and informal systems through which agricultural knowledge is created and shared	SES
Community and network influence	Peer learning	Learning through farmer-to-farmer interaction, mentorship, and local observation	DOI / SES
Community and network influence	Social influence	Influence of trusted peers, respected farmers, or role models on decision-making	DOI

Community and network influence	Institutional and peer networks	Networks linking farmers with organizations, associations, and other support actors	SES
Community and network influence	Research collaboration	Collaboration with researchers, institutions, or demonstration initiatives	SES
Market and sustainability considerations	Market access	Access to local, wholesale, retail, or direct markets for organic products	SES
Market and sustainability considerations	Profitability	Financial returns, viability, and economic sustainability of farming operations	DOI / SES
Market and sustainability considerations	Consumer demand	Influence of market demand for organic or chemical-free products	DOI / SES
Market and sustainability considerations	Long-term viability	Perceptions of whether organic agriculture can be sustained over time	DOI / SES
Market and sustainability considerations	Resilience	Capacity of farming systems to adapt to ecological, economic, or social pressures	SES

Organic farming sustainability	Challenges in sustaining practice	Ongoing difficulties after adoption, including labour, certification, and market pressures	SES
Organic farming sustainability	Confirmation and continuation	Whether adopters continue to see organic farming as worthwhile after adoption	DOI
Organic farming sustainability	Support for continuation	Conditions needed to sustain organic farming over the long term	SES / inductive
Emergent cross-cutting themes	Lifestyle and wellbeing	Farming choices linked to personal well-being, satisfaction, and way of life.	Inductive thematic analysis
Emergent cross-cutting themes	Skepticism of organic standards	Doubts about certification systems or the meaning of "organic."	Inductive thematic analysis
Emergent cross-cutting themes	Regenerative agriculture relationship	How participants relate organic agriculture to regenerative agriculture	Inductive thematic analysis
Emergent cross-cutting themes	Succession and future generations	Concerns about the future of the farm and the next generation	Inductive thematic analysis

Emergent cross-cutting themes	Competing policy priorities	Perception that other agricultural priorities receive more support than organic farming	Inductive thematic analysis
Emergent cross-cutting themes	Program eligibility restrictions	Cases where existing programs did not fit the farmers' needs or conditions	Inductive thematic analysis

APPENDIX F

Integrated Coding Framework

Theme	**Reported code**	**Framework construct**	**Brief description**	**n**	**RQ**
Awareness of organic agriculture	Farmer networks	**DOI**: Communication channels **SES**: Actors / social networks	Awareness developed through peers, neighbours, friends, and nearby farmers	5	RQ1
Awareness of organic agriculture	Diffuse knowledge sources	**DOI**: Knowledge stage/communication channels	General and anecdotal awareness based on indirect or non-specific information	4	RQ1
Awareness of organic agriculture	Limited expert consultation	**DOI**: Communication channels	Awareness shaped through limited contact with formal	1	RQ1

		SES: Knowledge systems/institutions	agricultural organizations or experts		
Awareness of organic agriculture	Direct experience / on-farm experimentation	**DOI**: Trialability	Awareness informed by direct exposure or limited practical experimentation	1	RQ1
Perception of organic agriculture	Compatibility with existing farming systems	**DOI**: Compatibility	Perception is shaped by whether organic agriculture fits current production methods and farm realities	9	RQ1
Perception of organic agriculture	Observability through peer farmers	**DOI**: Observability **SES**: Actors/peer networks	Perception is influenced by seeing neighbouring or trusted farmers using organic practices	7	RQ1
Barriers to adopting organic practices	Market uncertainty	**SES**: Governance systems/market conditions	Uncertainty about stable markets, buyers, and returns from organic production	9	RQ2
Barriers to adopting	Financial risks during the	**DOI**: Relative advantage/complexity	Economic vulnerability during	8	RQ2

organic practices	transition period	**SES**: Governance systems/market conditions	the certification transition phase		
Barriers to adopting organic practices	Increased labour requirements	**DOI**: Complexity **SES**: Labour/support conditions	Organic production is perceived as requiring more labour and management effort	5	RQ2
Barriers to adopting organic practices	Yield and pest-management risk	**DOI**: Complexity **SES**: Resource systems / ecological conditions	Concern about yield loss, weeds, disease, and pest control limitations	4	RQ2
Motivations for organic adoption	Ethical and moral motivation	Inductive thematic analysis	Values-based commitments and moral concerns about conventional agriculture shape adoption	10	RQ3
Motivations for organic adoption	Concerns about soil health and biodiversity	**DOI:** Relative advantage **SES**: Resource systems / ecological conditions	Adoption motivated by the desire to improve soil quality and biodiversity	10	RQ3

Motivations for organic adoption	Environmental stewardship	**DOI:** Compatibility **SES**: Actor values / ecological stewardship	Adoption linked to ecological responsibility and care for the land	8	RQ3
Motivations for organic adoption	Food quality and human health considerations	**DOI:** Relative advantage	Adoption motivated by perceived benefits for food quality and human health	8	RQ3
Challenges in sustaining organic farming	Limited market access	**SES**: Governance systems/market structures	Difficulty maintaining reliable and profitable markets for organic products	9	RQ4
Challenges in sustaining organic farming	Certification burden	**SES**: Governance systems/institutions	Record-keeping, compliance, and administrative requirements associated with certification	8	RQ4
Challenges in sustaining organic farming	Limited extension supports specific to organic farming	**SES**: Knowledge systems/support systems	Lack of localized and organic-specific technical support and advisory services	6	RQ4

Challenges in sustaining organic farming	Labour costs	**SES**: Labour/support conditions	Labour shortages and labour expenses are continuing constraints	4	RQ4
Institutional support and knowledge systems	Institutional and peer networks	**DOI:** Communication channels. **SES**: Actors/knowledge systems	Importance of peer learning, mentorship, networks, and relationships for support and knowledge exchange	23	RQ4
Institutional support and knowledge systems	Extension services	**SES**: Governance systems/knowledge systems	Role of formal advisory services, training, and technical support	17	RQ4
Institutional support and knowledge systems	Certification bodies	**SES**: Governance systems/institutions	Certification as a support mechanism for market credibility and access	14	RQ4
Institutional support and knowledge systems	Policies	**SES**: Governance systems	Policy-related supports or constraints affecting organic agriculture	6	RQ4

Institutional support and knowledge systems	Resource access	**SES**: Resource systems/support conditions	Access to inputs, services, or support resources relevant to organic farming	2	RQ4