

All Hands on Deck:
Agricultural Labour in British Columbia and Nova Scotia

By

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Abstract

Canada is experiencing an agricultural labour shortage that will contribute to economic and food-security challenges if left unchecked. This qualitative study explores how horticultural farm owners and operators in British Columbia and Nova Scotia perceive domestic workers, temporary foreign workers, and labour-saving technologies in meeting growing labour demands. Seven semi-structured interviews were conducted over Zoom, from February to April 2022, with farmers from both provinces. A thematic analysis was conducted, and eight predominant themes were identified from the interviews. These themes included the nature of the work, the perceived nature of the workers, the role of technology in meeting labour demands and increasing efficiency, strategies for successful labour planning, consumer perceptions of and interest in farming, farmer values and job satisfaction, external challenges impacting labour, and other opportunities being pursued by farmers. From this research, four broad categories of recommendations were proposed to support horticultural farmers in recruiting and retaining domestic workers, temporary foreign workers, and in adopting and implementing labour-saving technology.

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Chapter 1: Introduction

1.1 Canada's Agricultural Labour Problem

Providing Canadians with nutritious and fresh food has never been so nuanced or challenging. Farmers are facing challenges more complex than ever before including the effects of climate change, economic competition with other countries, rigorous food safety standards, and importantly, a labour shortage. While the domestic labour shortage is not new, it has quickly escalated and it is projected that 123,000 farm worker positions will be unfilled by 2029, impacting both Canadians and those countries who rely on Canadian exports (Standing Senate Committee on Agriculture and Forestry, 2014). Unfilled labour positions create a cascade of issues but reduced to its most basic implications can affect production in both the planting and harvesting seasons (Taylor & Charlton, 2019); farmland will lie fallow when there is not enough labour capacity to plant, and crops will decay in the field when there is not enough labour capacity to harvest. Thus, unfilled labour positions will lead to both economic and food security challenges.

Many factors exacerbate the domestic labour shortage in agriculture. Perhaps the biggest challenge is that Canadians no longer find the laborious, seasonal and oftentimes remote nature of agriculture work appealing. For decades, the number of Canadian workers entering the sector has been decreasing while the average age of those in the sector has increased. As of 2011, 55% of farm operators were aged >55 years (Statistics Canada, 2015). This share is even greater in the Atlantic provinces and British Columbia, where 60% and 61.6% of farm operators were aged >55 respectively (Statistics Canada, 2015). For both British Columbia and the Atlantic provinces, a 20% increase was seen in the share of workers aged >55 years from 1991 to 2011 (Statistics Canada, 2015). As the average age of farmers increases, so too does the rate of retirement. With so few entering the sector, so many retiring from the sector, and reportedly few farm succession plans in place (Canadian Agricultural Human Resources Council, 2019a; Statistics Canada, 2017a, 2017b), Canadian agriculture is in a precarious situation.

The agricultural sector is an important contributor to the Canadian economy but growing labour needs have led to significant financial loss. In 2020, the primary agriculture sector grossed \$39.8 billion, or around 2% of Canada's GDP (Agriculture and Agri-food Canada, 2021). However, \$2.9 billion was lost in 2017 alone as a direct result of unmet labour needs (Canadian Agricultural Human Resources Council, 2019a). Despite growing concerns over these unmet labour needs, there is hope in some quarters. For instance, some analysts propose that by closing the labour gap and investing in technology (known in the sector as ag-tech), the sector could generate an annual \$51 billion in GDP by 2030 (RBC Thought Leadership, 2019).

Nevertheless, there are currently dire shortages, and the situation is predicted to get worse. Moreover, it is not a new problem. In response to farmers and other sectors being increasingly unable to find domestic labour nearly 50 years ago, the Canadian government introduced the Temporary Foreign Worker Program in 1973 with the intent of matching foreign labour to

Canadian labour needs. The program is comprised of four different streams: the high wage stream, the low wage stream, the primary agriculture stream, and the permanent residency stream. The primary agriculture stream is the most used and accounts for 59% of all foreign workers entering the country (Standing Committee on Human Resources, 2016). It contains a sub-stream, the Seasonal Agricultural Worker Program (SAWP), that allows foreign workers to enter the country from Mexico or certain Caribbean countries for a total of eight consecutive months, as opposed to the regular 24 months.

Despite equity problems surrounding these programs (discussed further in the literature review) they provide the sector with vital workers. In 2019 alone, 46, 707 temporary foreign workers entered the country to work in agriculture, with over one-third entering from Mexico (Employment and Social Development Canada, 2021b). In British Columbia and Nova Scotia, 23% and 29% of the workforce is foreign, second only to Ontario on their reliance on foreign workers (Canadian Agricultural Human Resources Center, 2019; Canadian Agricultural Human Resources Council, 2019a, 2019b).

Governments, non-profits, and industry members have also recognized the agricultural labour problem and have joined the discussion. Since 2003, Agriculture and Agri-food Canada, the federal department of agriculture, has had ongoing engagement with industry experts. Here they appointed the Agriculture and Agri-food Labour Task Force whose goal was to conduct research on agricultural labour and make tangible recommendations (Canadian Agricultural Human Resources Council, n.d.; Government of Canada, 2022a). In their 2021 Mandate Letter, the Minister of Agriculture and Agri-food was committed to addressing chronic labour shortages in the sector, once again highlighting the Federal government's recognition of the agricultural labour shortage as a pressing issue.

The growing agricultural labour-gap is a cause for concern across Canada but is especially alarming in some regions. This is true for British Columbia and Nova Scotia, whose prevalent commodity types are particularly seasonal and laborious, and who are experiencing high rates of retirement among farmers.

This research has contributed to the body of knowledge surrounding the growing labour gap in Canadian agriculture. Scholarly literature speaks to the overarching themes that have posed challenges in the recruitment and retention of agricultural labour; the seasonality, physical nature of the work, and the competitiveness with other sectors to name a few. This research has expanded on what is known about this problem in both British Columbia and Nova Scotia from the farmer perspective as it relates to family and co-operatively owned farms specializing in horticulture, the predominant commodity type in each province. This knowledge will benefit policy and law makers in both provinces, allowing them to better understand what farmers at the local level perceive as challenges and opportunities in the recruitment and retention of workers. While this knowledge might be commonplace in the farming community, it is not clear from the literature how horticultural farmers in British Columbia and Nova Scotia view the potential of

these different labour groups to meet agricultural labour needs. Further, this is an important knowledge gap to fill. While all commodity types have their own unique recruitment and retention challenges, horticulture is particularly vulnerable amidst the labour shortage due to its particularly seasonal and laborious nature, making it less appealing to domestic workers. Thus, understanding how horticultural farmers are perceiving and experiencing the labour shortage will provide valuable insight on not just some of the unique challenges they may face, but also potential solutions to meet these challenges head on.

1.2 Thesis Purpose, Scope, and Research Questions

1.2.1 RESEARCH QUESTIONS

The primary research question investigated through this research was: How do farmers in British Columbia and Nova Scotia view the potential for domestic workers, temporary foreign workers, and technology in meeting labour demands? Secondary questions to support this are:

- What are the advantages and disadvantages of each labour group as perceived by farmers?
- What are the barriers and possible solutions—as perceived by farmers—to recruiting and retaining domestic or temporary foreign workers or implementing new technologies to meet labour demands?

1.2.2 RESEARCH DELIMITATIONS

Delimitations of this research study include:

1. *The perspectives of farmers working in commodities other than horticulture.* Horticulture is the predominant commodity in both provinces. Excluding other commodity types such as dairy & cattle, grain & oilseed, and aquaculture, will allow for an in-depth and nuanced understanding of the farm labour problem that is more specific to these provinces.
2. *The perspectives of labourers.* The perspective of farmers are the only ones that will be considered. The experience of labourers themselves, domestic and foreign, will not be collected through the interview process. Information and themes that are known about the labourer perspective will be included in the literature review.

1.2.3 CENTRAL TERMS

To ensure clarity, central terms used throughout this thesis are defined below.

- **Farmer:** An owner or operator of a farm.
- **Horticulture:** A commodity grouping including tree fruit and vine plants, field fruit and vegetables, and greenhouse, nursery, and floriculture. These commodities can be broadly divided into edible and non-edible plants.
- **Labour gap:** The estimated demand of agricultural labourers less the supply of domestic agricultural labourers (Canadian Agricultural Human Resources Council, 2019a).
- **Labour groups:** Groups that are used to meet labour needs. These include domestic workers, temporary foreign workers, and labour-saving technologies.
- **Labour-saving technologies:** Technology that increases productivity and outputs while reducing economic and physical (labour) inputs (Ryan, 2019). This includes precision agriculture, automation, robotics, and artificial intelligence.

1.3 Conceptual Framework

This research is rooted in Interpretivism and accepts participant experiences as knowledge. While other studies, identified below in the literature review, have investigated issues surrounding agricultural labour, many have done so from a top-down perspective and by employing other epistemologies. This work assumes that the farmer perspective is valuable and that the audience can learn from these perspectives, especially given the nature of the semi-structured interviews that were used.

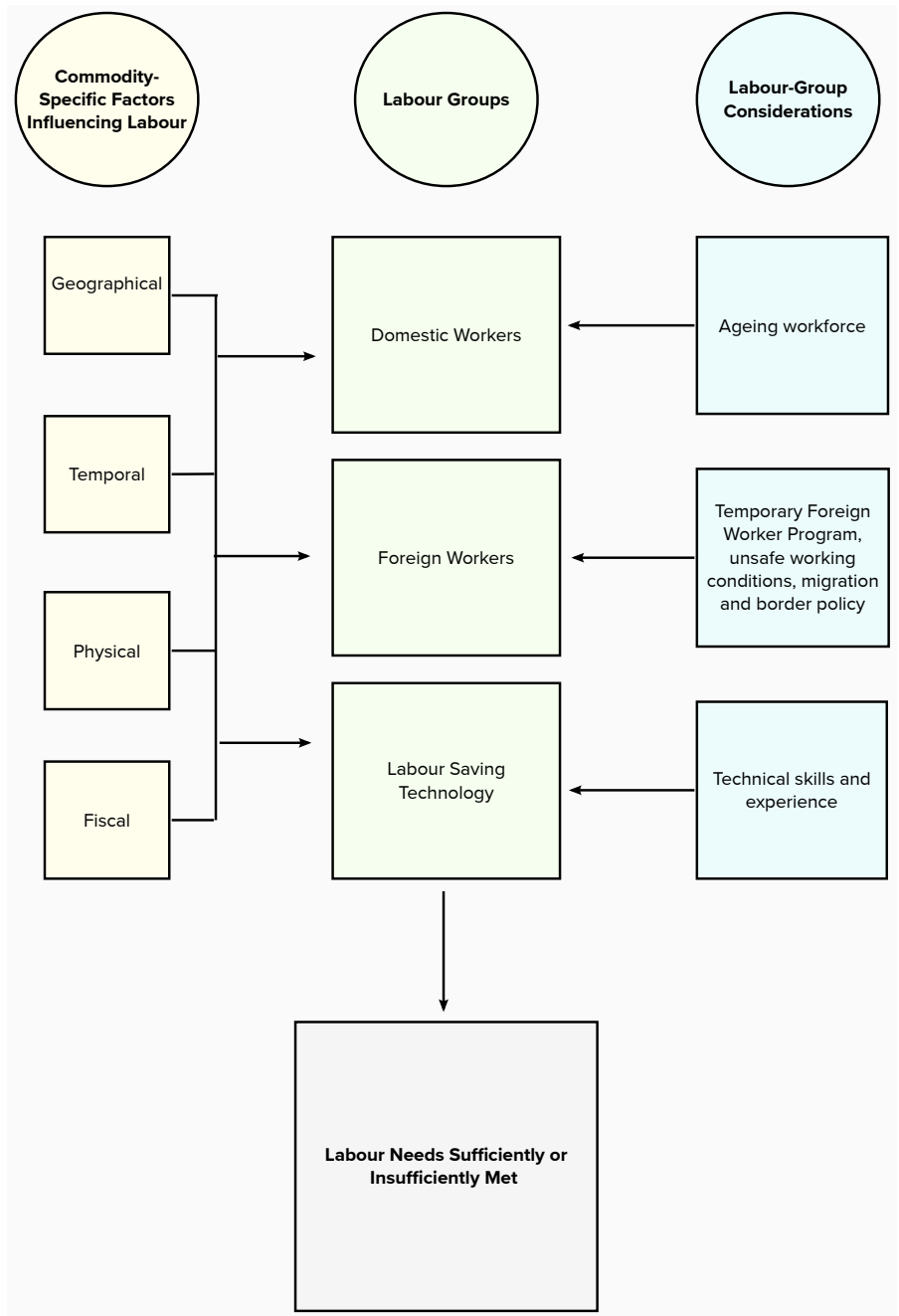
The following conceptual framework (Figure 1) was developed for this project by drawing on themes identified in an important report by the Canadian Agricultural Human Resources Council (2019a), titled, *How Labour Challenges Will Shape the Future of Agriculture*. While many factors influence agricultural labour needs; these factors can be categorized in two ways:

1. Commodity characteristics and;
2. Labour group considerations.

The conceptual framework illustrates the relationship between both the commodity characteristics and the labour group considerations, demonstrating how both have can influence whether a labour group could be likely to meet labour needs. The conceptual framework was used to guide the author's understanding of the labour problem as it was described in the literature, and the following literature has been organized to reflect the conceptual framework.

While the conceptual framework was rooted in the literature, the farmers that were interviewed provided valuable insights on commodity characteristics and labour group considerations that revealed just how complex agricultural labour planning has been for these farmers, discussed further in chapter 5.

FIGURE 1: CONCEPTUAL FRAMEWORK - LABOUR GROUP AND COMMODITY FACTORS INFLUENCING LABOUR NEEDS



(Author's own elaboration)

1.3.1 COMMODITY CHARACTERISTICS

In a 2019 report, the Canadian Agricultural Human Resources Council identified five commodity types, each with their own set of unique challenges affecting labour recruitment and retention. These commodity types were (1) Horticulture, (2) Dairy, Poultry & Egg, (3) Red Meat, (4) Grain & Oilseed and (5) Aquaculture.

Labour recruitment and retention challenges unique to commodity types other than horticulture are not within the scope of this paper and will not be addressed, although there may be overlap.

Labour recruitment and retention in horticulture is impacted by temporal and physical factors. It is highly seasonal and requires meticulous hand picking and packaging (Canadian Agricultural Human Resources Council, 2019a). While more likely to be located closer to urban centers than other commodity types, it is more physically demanding than the work found in other commodity types (Canadian Agricultural Human Resources Council, 2019a).

1.3.2 LABOUR GROUP CHARACTERISTICS

There are three ways in which farmers can meet labour needs: (1) domestic workers, (2) temporary foreign workers, and (3) labour-saving technologies. Labour-saving technology and automation are included as a labour group as it has been adopted by farmers to increase productivity and outputs while reducing economic and physical (labour) inputs (Ryan, 2019). Each labour group broadly has its own characteristics, values or circumstances that makes employment or implementation in certain commodity types more prevalent than in others.

DOMESTIC WORKERS

Domestic workers can be further categorized by age. Young Canadians are less likely to enter or remain in the sector than they once were. Barriers to entering the sector for young Canadians as farmers include high costs, low income, and limited land availability (Qualman et al., 2018). The sector is also experiencing an ageing workforce, with a significant number of older Canadians soon set to retire. Overall, fewer Canadians are living in rural areas where farming operations often take place (Canadian Agricultural Human Resources Council, 2019a) and domestic workers are more inclined to accept permanent, full-time work over temporary and seasonal positions (Rotz, Gravely, et al., 2019).

FOREIGN WORKERS

Temporary foreign workers are more likely to fill the lower paying, more laborious and seasonal positions that domestic workers aren't. This is due in part to the design of the Temporary Foreign Worker Program that requires farmers to complete a Labour Market Impact Assessment before hiring foreign workers. As a part of this assessment, farmers must prove that the position they are seeking to fill couldn't be filled by a domestic worker. It is for this reason that foreign workers entering Canada through these programs end up taking on positions that are deemed undesirable for domestic workers (Strauss & McGrath, 2017).

LABOUR-SAVING TECHNOLOGIES

Implementation and use of labour-saving technologies and automation are impacted by infrastructure, like internet access, and often have large start-up costs (Fleming et al., 2018; Rotz, Duncan, et al., 2019). As a result, geographical location, profitability, and size of a farm could impact their likelihood of being used to meet labour demands.

1.4 Structure of Thesis

This thesis proceeds in five chapters. Following this introductory chapter, the literature review delves into the broader challenges impacting Canadian agriculture, locating labour within this mix, before looking at what is known regarding the domestic workers and temporary foreign workers, including work preferences, and ethical challenges surrounding the Temporary Foreign Worker Program. It then looks at future key challenges the sector will face, including equitable implementation of labour-saving technologies and automation. Chapter Three describes the methodology, methods, and data analysis used in this qualitative research. Chapter Four identifies eight distinct themes derived from the data while the final concluding chapter revisits the research question and discusses the implications of this research, unexpected findings, policy recommendations for governments and areas for future research.

Chapter 2: Literature Review

2.1 Mapping the Process

All resources used in the literature review were available online, in English, and were prepared after the year 2000. These included scholarly journal articles, reports funded by sector interest groups and stakeholders, Government publications, and e-books. These were searched via the following key terms:

- Adoption
- Agribusiness
- Agricultur*
- Automation
- Canad*
- Climate change
- Cost
- Domestic worker*
- Efficiency
- Farm*
- Farmer*
- Food prices
- Food safety
- Food security
- Food sovereignty
- Horticultural
- Horticulture
- Implementation
- Labo*r
- Monocropping
- Perception*
- Rural
- Seasonal Agricultural Worker Program
- Technolog*
- Temporary Foreign Worker Program
- Temporary foreign worker*
- Urban
- Wage*
- Worker*

The agricultural labour sector faces many compounding challenges. The literature review first identifies the general challenges within the sector, locating the labour problem in this mix. It then turns to the different labour groups and how farmers access them. Finally, it discusses the future key pressures that the sector is up against, including the implementation of labour-saving technology and the implications this will have on farmers and the different labour groups.

2.2 Agriculture, Labour & Other Challenges

The Canadian agricultural sector is vast and complex. Labour is not the only challenge that farmers and agribusinesses experience but is one important component in a slew of interrelated challenges. In 2014, the Standing Committee on Agriculture and Forestry released an extensive report identifying four primary challenges that are deeply intertwined: demographic, environmental, economic, and social challenges (Standing Senate Committee on Agriculture and Forestry, 2014).

As described in Chapter 1, demographic changes such as an aging population, rural depopulation, and lack of young people entering the sector have long posed labour challenges within the domestic workforce. Many have identified that high capital costs are one of the most pressing barriers to entry for young people who wish to enter the sector as a farm owner or operator (Blais et al., 2021; Qualman et al., 2018; Standing Committee on Agriculture and Agri-Food, 2010; Standing Senate Committee on Agriculture and Forestry, 2014). Other barriers to entry include lack of mentorship and education and access to land (Blais et al., 2021; Qualman et al., 2018; Standing Senate Committee on Agriculture and Forestry, 2014).

The effects of climate change, including an increase in the number and severity of hurricanes, floods and fires, put crops at risk. Late frosts damage crops early in the season, and fluctuating temperatures change the length of growing seasons, making it challenging for farmers to plan their labour force (Agriculture and Agri-Food Canada, 2020). Meanwhile, some farming practices exacerbate the effects of climate change, like deforestation and land management techniques (Dzisiak et al., 2020). In 2020, the agriculture sector was responsible for 8.2% of Canada's greenhouse gas emissions (Government of Canada, 2022b). This number is closely linked to one of the economic challenges faced by the sector, economies of scale. In agriculture, economies of scale promote large, monocropping farm operations whereby farmers can reduce their inputs and increase their economic output, increasing farm efficiency (Duffy, 2009; Nayak, 2018). There are many challenges associated with economies of scale in agriculture that are often not included in the equation of increased farm efficiency. Social challenges include food safety when mass producing food and the impact that agribusiness monopolies have on small scale farms and on rural communities (Duffy, 2009; Nayak, 2018; Standing Senate Committee on Agriculture and Forestry, 2014).

Looking at a larger scale, the global population is set to increase by 2 billion in the year 2050, further increasing the demand for food production and putting pressure on an already stretched

food system (United Nations, 2022). Natural resources like water and land will be a limiting factor in working to meet growing global food demands and many have recognized that sustainable farming practices will be needed to minimize environmental degradation as farming practices expand (Blais et al., 2021; Dzisiak et al., 2020; Government of Canada, 2021; Standing Senate Committee on Agriculture and Forestry, 2014).

Competition in the global export market have economic repercussions for the sector. When competing against countries who sell their food for low prices, Canadian farmers have been forced to lower prices to remain competitive, despite the rising costs of farm inputs (Standing Senate Committee on Agriculture and Forestry, 2014).

Social challenges in Canadian agriculture include three interrelated concepts - food safety, food security, and food sovereignty. These concepts refer to the ability of households to reliably access safe, nutritious, and culturally appropriate food in sufficient quantities and in socially and environmentally acceptable ways (Food Secure Canada, n.d.; Government of Canada, 2020). As of 2020, around 11% of Canadians were experiencing food insecurity (Statistics Canada, 2022). However, food insecurity is not always related to a lack of food. In fact, Canadian farmers produce more than 2.5 times the food required to feed all Canadians (Standing Senate Committee on Agriculture and Forestry, 2014), highlighting that it is the unequitable distribution of food causing this problem.

Farmers are facing many interrelated and broad challenges, impacting them both on the ground and at the policy making level. As the impacts of these demographic, environmental, economic, and social challenges are felt by farmers, the ongoing labour crisis continues to threaten. The question remains: in the wake of these challenges, who will plant and harvest our food? While these challenges must be addressed by law and policy makers for the sector to truly thrive, this paper focuses on the issue of labour as it relates to the three labour groups – domestic workers, temporary foreign workers, and labour-saving technology.

2.3 What Labour Looks Like

2.3.1 DOMESTIC WORKERS

Several factors have been identified as challenges for Canadian farmers in recruiting and retaining skilled and experienced domestic labour (Canadian Agricultural Human Resources Council, 2019a):

1. Geographical – the rural nature of the work
2. Temporal – the seasonal nature of the work
3. Physical – the physically demanding nature of the work
4. Fiscal – competition for labour with other sectors and
5. Public perceptions – how Canadians view the industry.

2.3.1.1 GEOGRAPHICAL FACTORS

For many years, rural communities have experienced depopulation as young people migrate to urban centers for educational and career opportunities. Thus, the rural nature of agricultural work is a deterrent for many Canadians who simply do not live close enough to reasonably work these in these positions (Canadian Agricultural Human Resource Council, 2015; Canadian Agricultural Human Resources Council, 2019a). Studies have found that some commodity types are more impacted by the rural nature of this work than others. Horticultural farms are the least impacted by geographical factors and are more often located closer to urban centres than other farm types (Canadian Agricultural Human Resource Council, 2015; Canadian Agricultural Human Resources Council, 2019a). This might be particularly true in British Columbia, where Agricultural Land Reserves are concentrated relatively closed to urban centers in the Okanagan Valley and lower mainland.

2.3.1.2 TEMPORAL FACTORS

Domestic labourers typically seek permanent full-time employment and view agricultural work as temporary instead of an annual commitment (Rotz, Gravely, et al., 2019). The implications of this are twofold. Firstly, if domestic workers do not view agricultural work as an annual commitment, they are likely entering the sector with little to no experience and would not be able to complete their jobs efficiently, at least at first. Secondly, this means that farmers spend valuable time training individuals who are unlikely to return the following season.

While some agricultural commodity types can offer year-round positions, like the dairy and aquaculture industries, horticulture is particularly seasonal due to the nature of the crops (Canadian Agricultural Human Resources Council, 2019a). Labour demands in this position are near non-existent in the off season, while labour needs are significant during the planting and harvesting seasons.

2.3.1.3 PHYSICAL FACTORS

Agricultural work tends to be physically demanding and this is particularly true within horticulture. Many products (ie. berries, applies, flowers, etc.) must be hand-picked and packaged to avoid

bruising and damage. As horticulture is the predominant commodity in British Columbia and Nova Scotia, it is unsurprising that both scored above the national average with farmers citing, “work is too physical” as a barrier to employee retention (Canadian Agricultural Human Resources Council, 2019c, 2019b). Farm-type and growing practices can also affect the level of physical labour required of a worker. For example, a farm that does not use pesticides requires more labourers or labour-saving technology for weeding than a farm that does (Popp et al., 2013). Finally, farmer perceptions of worker abilities can influence the hiring practice. For example, one study found that farmers perceived the physical nature of the work as being less suited for individuals with disabilities (Canadian Agricultural Human Resources Council, 2019a).

2.3.1.4 FISCAL FACTORS

The low wages paid to agricultural labourers have created employee retention issues for farmers (Canadian Agricultural Human Resources Council, 2019a). This is partly due to the competition for workers in other sectors, who have historically been able to pay their employees higher wages. This phenomenon is known as the ‘agricultural wage gap’ and while it has been recognized by many in the industry (Canadian Agricultural Human Resources Council, 2019a; Canadian Federation of Agriculture, 2016) it has narrowed over time. In fact, wages paid in Canadian agriculture have risen faster than those in other sectors (Canadian Federation of Agriculture, 2016). However, continuing to raise wages could greatly affect farmer profit margins, that are oftentimes thin to begin with, or increase the price of food for consumers (Conference Board of Canada, 2016).

Despite rising wages for agricultural labourers, the domestic labour gap continues to grow. This perhaps indicates that (1) domestic workers are unaware of the higher paying career paths in the sector and that wages have increased or (2) that these increased wages are not incentive enough for domestic workers to take on these often-times physically laborious, remote, and seasonal positions.

2.3.1.5 PUBLIC PERCEPTIONS

Canadians have a negative perception of what agricultural labour entails primarily due to the four factors described thus far (Canadian Agricultural Human Resources Council, 2019a), however, studies have shown that they do perceive the work that farmers do as positive (Agriculture and Agri-Food Canada, 2021; Phoenix Strategic Perspectives Inc., 2017). One study found that participants perceived farmers as “hard-working, dedicated, family, generation, heritage, entrepreneurial, independent, innovative, conservative, proud, simple and essential” (p. 3) and noted that they are under-appreciated (Agriculture and Agri-Food Canada, 2021). This same study noted that Indigenous participants were more likely to perceive farmers as negative than non-Indigenous participants. Another study reported that 81% of Canadians positively perceived farmers and described them as important to the economy (Phoenix Strategic Perspectives Inc., 2017).

Given the conflicting views that Canadian's hold on farmers and agricultural labour as a viable career, there is a misalignment in the work values they seek and the agricultural labour positions that are available. It is possible that Canadians have misconceptions on the degree to which agricultural labour positions are physical and low-paying, as the Canadian Agricultural Human Resources Council (2015) noted that high-paying jobs with opportunities for career advancement are abundant, although it is not clear which commodity type offers these positions.

2.3.2 TEMPORARY FOREIGN WORKERS

BENEFITS AND CHALLENGES RELATING TO THE TEMPORARY FOREIGN WORKER PROGRAM

Canada has come to depend on temporary foreign workers to meet agricultural labour demands and as of 2016, these vital workers filled 75% of the agricultural labour gap (Conference Board of Canada, 2016). In 2019, record numbers of temporary foreign workers entered the sector through the program (Conference Board of Canada, 2016; Falconer, 2020). In 2020, with the onset of the COVID-19 pandemic and related border closures and isolation requirements, the number of foreign workers able to enter the country on time for the planting season dropped significantly.

The pandemic highlighted just how much Canada has grown to rely on these important workers and re-emphasized some of the well-documented and long-standing issues surrounding the Temporary Foreign Worker Program (TFWP). These include crowded housing, social isolation, unregulated and unsafe workplaces, and reduced access to services including medical care (Caxaj & Cohen, 2021a, 2021b). These issues only worked to exacerbate COVID-19 cases among the already vulnerable population, who experienced caseloads only second to those in living long-term care homes (Black, 2020; MNP LLP, 2020).

Other ethical issues surrounding the program include the 'Naming' aspect and pathways to permanent residency. Due to the 'Naming' aspect of Temporary Foreign Worker Program, whereby farmers can request the same temporary foreign workers in subsequent years, workers are not incentivized to voice concerns over unsafe working conditions due to fear of losing their position (The North South Institute, 2006). For years, researchers and advocacy groups in the sector called for better, more direct pathways to permanent residency for 'low-skilled', seasonal agricultural workers (Caxaj & Cohen, 2021a; Conference Board of Canada, 2016; Doggett & Ratto, n.d.; Esses et al., 2021; Hennebry, 2012; Landry et al., 2021; Otero & Preibisch, 2015; Preibisch, 2010; Standing Committee on Human Resources, 2016; Strauss & McGrath, 2017; Weiler, 2018; Weiler et al., 2017). Historically, federal immigration programs favoured higher skilled workers and there weren't many options for agricultural labourers seeking permanent residency. The Seasonal Agricultural Worker Program has extremely low permanent residency transition rates, despite having high renewal rates (Falconer, 2020), indicating an on-going need for these 'temporary' workers, who often return year after year. Researchers in the field refer to these workers as "permanently temporary" (Caxaj & Cohen, 2021b; Hennebry, 2012). In response to these criticisms, the Federal government implemented the Agri-food Pilot in May 2020. This

program has offered another pathway to permanent residency for temporary foreign workers in agriculture, among other sectors, and will run until May 2023 (Government of Canada, n.d.).

Work to improve the Temporary Foreign Worker Program has been ongoing, including a review of the program that resulted in 21 recommendations for Employment and Social Development Canada, who administers this program, to implement (Standing Committee on Human Resources, 2016). Over 2020 – 2021, the Office of the Auditor General of Canada conducted a performance audit that focused on whether the Temporary Foreign Worker Program was delivered in a way that protected temporary foreign workers from COVID-19. In both years that the audit was conducted, they found that Employment and Social Development Canada did not sufficiently conduct or enforce health and safety inspections, nor did they meet their previous commitments to improve the living conditions of temporary foreign workers (Office of the Auditor General of Canada, 2021). In 2021, Employment and Social Development Canada conducted a review of the Temporary Foreign Worker Program and have since announced changes to the *Immigration and Refugee Protection Regulations (Temporary foreign workers)* that help to protect workers and streamline the application process for trusted repeat employers (Employment and Social Development Canada, 2022).

FARMER PERSPECTIVES

Little literature is available on the farmer perspective on the recruitment and retention of foreign workers and the Temporary Foreign Worker Program. Importantly, much of the research focuses on the precarious and unsafe working and living conditions experienced by foreign workers, discussed in more detail in the next section. Thus, this research is important as it adds the farmer perspective.

One 2014 study identified farmer perspectives on foreign worker health and safety through one-on-one qualitative interviews, much like this paper. While not the primary focus of their interviews, these Ontario farmers identified several benefits of hiring foreign workers over domestic workers. These included predictability, manageability, diligence, and cost-effectiveness (Narushima & Sanchez, 2014). Notably, their small sample size also reported that they relied heavily on foreign workers, however many were reluctant to speak on the health and safety conditions these workers faced.

FOREIGN WORKER PERSPECTIVES

Studies that included interviews and surveys with temporary foreign workers were generally negative. One 2020 study (Cohen & Hjalmarson, 2020) found that there were four ways in which migrant workers resist structural vulnerabilities on the farm: working under the table, collective work pacing, falsifying hours on time sheets, and reappropriation of farm produce. These acts imply that working conditions on farms were not ideal. Several participants quoted in this article noted that sending money home to their families was worth the poor working conditions and fear of deportation they experienced on the farm. Another study that surveyed 170 migrant agricultural workers reported a negative experience with health, social and legal services. Many

reported that they did not know how to file a formal complaint against their employer, did not have confidence that they could access health care services, reported challenges in communicating with health and social services, and did not feel that they had the same rights as Canadian citizens (Colindres et al., 2021). Another study looked at migrant workers and food security (Weiler et al., 2017). Many migrant workers reported that they experienced food insecurity both in their home countries and while in Canada, which often led to health problems. They also reported experiencing positive practices implemented by their employer, including being provided with a cook, their own garden plot, and culturally appropriate food. A common theme found in these works is apparent; negative working conditions while in Canada are endured so that migrant workers can support their families back home and protect their livelihoods.

2.4 Future Key Pressures: Technology Adoption and Implementation

While there are still mounting challenges in demographic, environmental, economic, and social spheres that will shape the future of Canadian agriculture, they are not within the scope of this paper. Perhaps one of the most significant future key pressures impacting labour is the adoption and implementation of new ag-tech (i.e., agricultural technologies).

Labour-saving technologies, including automation, precision agriculture, robotics, and artificial intelligence, have the potential to improve working conditions, reduce manual labour inputs and to increase farm outputs (RBC Thought Leadership, 2019). For these reasons, technology is poised to disrupt the status quo of how agricultural work is done, affecting farmers and labourers. There are two common themes that present in the literature regarding these technologies: barriers to adoption and equity issues surrounding implementation.

BARRIERS TO ADOPTION

Adoption of these technologies is lower than anticipated and has varied across the country (Aubert et al., 2012; Chavas & Nauges, 2020; Mitchell et al., 2020). Adoption within speciality crops as found in horticulture are especially low, while uptake has been more widespread within other commodity types like grains (Gallardo & Sauer, 2018). Two primary barriers to adoption are noted in the literature: (1) high capital costs and (2) farmer perceptions and characteristics (Aubert et al., 2012; RBC Thought Leadership, 2019).

The burden of high investment costs in these technologies is carried by the farmer, who may already be seeing thin profit margins and who would not see a return on their investment until after the harvest season at best. In this way farmers take on significant financial risk when investing in these technologies. Exacerbating the high cost in these technologies are Canada's low investment in ag-tech, that most of this technology is built abroad and imported, and that profitability is the core motivator for tech companies (RBC Thought Leadership, 2019; Rotz, Duncan, et al., 2019). To combat high investment costs, several recommendations have been made, including co-operative and publicly funded tech companies and increasing Canada's

investment in ag-tech production (RBC Thought Leadership, 2019; Rotz, Duncan, et al., 2019). Other recommendations for reducing the capital barriers for young farmers entering the sector in general, and not just in relation to high technology costs, include government funding programs and preferential lending rates from financial institutions (Blais et al., 2021).

Farmer perceptions also play an important role in technology adoption. Studies have found that how farmers perceive the usefulness, usability, benefits, and risks of the technology are significant indicators on their likelihood of adoption (Aubert et al., 2012; Chavas & Nauges, 2020). Potential solutions noted in the literature addressing farmer perceptions include using farmer networks to increase knowledge surrounding these technologies, increasing the trialability of these technologies' and to approach technology development from a bottom-up approach that includes farmers (Aubert et al., 2012; Chavas & Nauges, 2020; Rotz, Duncan, et al., 2019).

Finally, farmer characteristics may play a role in their likelihood of technology adoption. However, conflicting evidence has been reported on if education levels and age impact technology adoption (Aubert et al., 2012; Chavas & Nauges, 2020; RBC Thought Leadership, 2019). Research on technology adoption by Canadian farmers is scant and there is a clear gap in the literature when it comes to Canadian horticultural farmers. More research may be warranted on labour-saving technology as it relates to horticulture and the diverse crops encompassed in this commodity type.

EQUITY ISSUES SURROUNDING IMPLEMENTATION

There are equity issues surrounding technology implementation for both farmers and labourers. The negative impacts on farmers are discussed less in the literature, perhaps because these effects are less pervasive for farmers than they are labourers.

Farmer equity issues surround farm characteristics, farmer profits, and data ownership. It is likely that large-scale farms will benefit more from technology implementation than smaller farms due to economies of scale. Further, bigger, peri-urban farms are more likely to have access to the required infrastructure, like internet, than smaller and rural farms (Aubert et al., 2012; Fleming et al., 2018). This may prove positive for horticultural farms that are often located closer to urban centers than farms of other commodity types (Canadian Agricultural Human Resources Council, 2019a). One study (Chavas & Nauges, 2020) noted that technology adoption may ultimately reduce farmer profits by lowering the cost of food, but others have speculated that with the implementation of technology, farm efficiency and therefore profits will improve (Gallardo & Sauer, 2018; RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019; Ryan, 2019). Finally, the data produced by farmers but ultimately owned by tech companies may put these companies in positions of power with increased control over farmers (Rotz, Duncan, et al., 2019; Ryan, 2019).

Labourer equity issues stem from the very direct way in which technology implementation will impact their day-to-day jobs. Many researchers have projected that agricultural

labourers, who are often racialized and underserved, will be displaced by labour-saving technology and more specifically, automation (Marinoudi et al., 2019; RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019). While these ‘low-skilled’ workers are the most likely to be displaced by technology, the number of less precarious, higher-skilled, and better-paid positions will increase. One study (Gallardo & Sauer, 2018) suggested that agricultural labourers will not necessarily be displaced, but that their jobs simply will change. Mindful governance will be required to oversee this technological transition to ensure that temporary foreign workers are not left behind. One common theme drawn from the literature is to develop and provide re-training and upskilling programs for ‘low-skilled’ workers to allow them to work in the ‘higher-skilled’ positions that are to come (Gallardo & Sauer, 2018; Marinoudi et al., 2019; RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019).

Chapter 3: Methodology and Methods

This chapter outlines the methodology, methods and data analysis used to answer the research question, ‘How do farmers in British Columbia and Nova Scotia view the potential for domestic workers, temporary foreign workers, and technology in meeting labour demands.’ Secondary questions to support this are:

- What are the advantages and disadvantages of each labour group as perceived by farmers?
- What are the barriers and possible solutions to recruiting and retaining or implementing each of these labour groups as perceived by farmers?

HREB approval was sought for this study as farmers were interviewed and their responses recorded. The certificate approval number is 21-0264.

3.1 Methodology

This qualitative study employed an interpretivist lens that, “focused on context, and on situated actors’ own understandings” p. 8 (Schwartz-Shea et al., 2020, p. 8). Grounded Theory, which closely relates to this idea, was also used to root the researcher’s understanding of the problem and is defined as:

“The use of the constant comparative method to explore each data source in relation to those previously analysed. Taken up by researchers who believe it is important to cast aside all preconceived notions and simply let the data tell the story” p. 625 (Leary, 2017).

While there is much written in the literature about the challenges faced in modern agriculture, including those related to labour, this study sought to understand farmer perspectives as they relate to labour within a specific environment (province and commodity type). The researchers wanted to know how farmers were *perceiving* and *experiencing* the labour crisis, lending well to Grounded Theory.

Allowing the data to tell the story was a crucial component of answering the research question, especially considering the positionality of the researcher who has no ties to the agricultural sector and who had accepted participant reality as reality.

3.2 Methods

Semi-structured, qualitative interviews were conducted with seven farmers (i.e., farm owners or operators) in both British Columbia and Nova Scotia (Figure 2). Initially, 12 farmer interest groups and horticultural organizations were contacted by email seeking permission to contact and recruit their members for this study. Most organizations were unable to share member

information but provided alternative groups that might have members willing to participate in this study. Ultimately, two horticultural organization websites, one from each province, were used to make initial contact with potential study participants. These organizations had publicly listed the contact information of their consenting members.

Broad criteria were used to select farmers who would be appropriate for this study. Inclusion criteria were farmers from British Columbia and Nova Scotia whose primary commodity type was horticulture (i.e., tree fruit & vine, field fruit & vegetables, or greenhouse, nursery, & floriculture) and who employed at least one labour group (i.e., domestic labourers, temporary foreign workers, or labour-saving technology or automation). Information about commodity type and labour was found on the publicly available websites of each farm. Exclusion criteria were farmers whose primary commodity type was one other than horticulture or those who did not employ any form of labour. Finally, only those who had an email address publicly listed on the horticultural organization websites, as opposed to just their phone numbers, were contacted.

Selected participants were contacted by email on a rolling basis, up to two times before they were removed from the potential interviewee list if they did not respond. To bolster response rates, farmers were contacted during the 2021 off-season (January – March), as opposed to their busy planting and harvesting seasons and research methods were expanded to include written responses. A total of 50 farmers or farm organizations were invited to participate in this research study. Of these 50 contacts, seven individuals responded. A low response rate was not unexpected, as a similar research study that conducted qualitative interviews with Canadian farmers had also yielded low response rates (Narushima & Sanchez, 2014).

Six participants consented to participate in an interview over Zoom or telephone. The record and transcribe features of Zoom were used, and interview data was anonymized and exported as audio clips and transcripts. One participant consented to participate in the study via a written response, whereby the participant was provided with the interview questions in a Word document via email.

The risks that were associated with this study (i.e., a breach in confidentiality) were considered low and were mitigated through participants selecting their attribution type (non-attributable, attributable with anonymity, or attributable with direct quotes) and the data storage process. To protect participant confidentiality, all interviews were anonymized and numbered as interviewee 1, interviewee 2, etc. Data was saved on a password protected external hard drive.

TABLE 1: INTERVIEWEE DEMOGRAPHICS

Interviewee Label	Location
1	British Columbia
2	British Columbia
3	British Columbia
4	British Columbia
5	Nova Scotia
6	Nova Scotia
7	Nova Scotia

3.3 Data Analysis

Thematic and discourse analysis was done using NVivo software. Discourse analysis, “interprets language as it is situated in a socio-historic context. Rather than focus on what is said, it explores language as it constitutes and embodies a socio-historic context tied to power and knowledge” (Leary, 2017). Inductive coding was used to draw common language from the data, highlighting common themes and narratives.

3.4 Reliability and Validity

Techniques used to establish reliability included using the same open-ended questions in each interview. Where applicable, questions were phrased in opposing ways allowing for multiple perspectives to be shared, for example by asking, “What are the main challenges and opportunities of your farm business now and in the longer term?”

In terms of establishing validity, the researcher conducted two processes. Firstly, interviews were recorded and transcribed into digital files using built-in features on Zoom. NVivo software was then used to thematically code the data collected using an inductive approach.

3.5 Strengths and Limitations

Limitations - The primary limitation of this research was the small sample size of 6 interviews and 1 written response. To increase the number of interviews conducted, invitations were sent to horticultural organizations and individual farmers on a rolling basis, before the start of the planting season where possible. Upon request from potential interviewees, this research study was expanded to include written responses, increasing the sample size by 1.

Strengths – Despite the small sample size, the nature of the semi-structured qualitative interviews allowed for rich conversation that was led by the participants. This ensured that each participant was able to share what they perceived as the biggest challenges and strengths related to recruiting and retaining labour.

Chapter 4: Results

4.1 Introduction

The aim of this research was to understand how farmers in British Columbia and Nova Scotia viewed the potential of domestic workers, temporary foreign workers, and labour-saving technology and automation in meeting growing labour demands. This included understanding the advantages and disadvantages of working with each labour group, and the barriers and possible solutions to recruiting and retaining domestic and foreign workers and implementing labour-saving technology. This was accomplished by employing inductive coding that resulted in the emergence of eight themes from the data, drawing a narrative surrounding the state of agricultural labour in British Columbia and Nova Scotia. Some of the common themes align with the conceptual framework discussed in chapter 1 while others are unanticipated, like the impact of external factors on successful labour planning. Themes are as follows:

- The nature of the work: Commodity and farm characteristics influencing labour recruitment and retention
- The nature of the workers: Labour group characteristics influencing workforce planning
- The role of technology in meeting labour demands and increasing efficiency
- Strategies for successful labour planning
- Consumer perceptions of and interest in farming
- Farmer values and job satisfaction
- External challenges impacting labour
- And farm diversification: Other opportunities.

Before going on to describe the results, it is important to note the characteristics of the farms from which the participants shared their experiences (Table 2).

TABLE 2: INTERVIEWEE FARM ATTRIBUTES

Farm Attributes	Number of Interviewees
Owned or operated a farm in British Columbia	4
Owned or operated a farm in Nova Scotia	3
Produced horticultural products	7
Family owned	6
Employed temporary foreign workers	5
Planned to hire temporary foreign workers in the future	1
Certified organic	1
Sold products in the local market (via u-pick, Community Supported Agriculture, farmers markets, roadside stands, or directly to local restaurants or chain stores)	7
Sold products in the North American market	5
Sold products in the international market	3
Sold fresh and frozen products	3

Note: This table identifies farm attributes among the total sample of seven research participants.

4.2 Main Themes

4.2.1 THE NATURE OF THE WORK

“Canadians are, you know, they don't like to work in the snow, the rain, the heat. They don't like to do heavy lifting or hard work anything that is physically demanding is just not in the repertoire. Everybody wants to be a barista and have a professional degree, and sitting in office, and you know I mean I can understand the pull of that. But farming isn't like that, and you can't make it like that. There's nothing that we can do that changes the fact that you are pruning a blueberry plant.” – Interviewee One

Participants noted that geographical, temporal, physical and fiscal factors influenced their ability to recruit and retain skilled domestic labour. The impacts of rurality and remoteness on access to labour were varied; one participant was located near a large population base, while another was located remotely and reported high commuting costs as a challenge in recruiting and retaining staff. This aligned with findings in the literature that identified ruralness and commuting costs as one factor impacting recruitment and retention of domestic labourers (Canadian Agricultural Human Resources Council, 2019a). Ruralness did not impact temporary foreign workers as they were provided with on-site housing. Participants did not speak to the effects of ruralness on implementing or accessing labour-saving technology.

Temporal factors, or the seasonal nature of the work, has spurred farmers to be creative in their crop and workforce planning. Three participants strategically changed their crop types or varieties to ones that were planted and harvested in different periods, creating steadier working hours for labourers. This practice was implemented in response to prospective labourers wanting longer contracts and to prevent hired workers from having an inadequate amount of work to do. One respondent stated that they, “couldn't hold it against them” if a labourer was able to find more hours elsewhere. Other factors influenced the diversification and changing of crop types and varieties, including climate change and the lack of labourers, described in subsequent themes. Other strategies to navigate the temporal nature of the work were to hire students with time off in the harvesting season, and local community members including retirees and children.

The physically laborious nature of the work, including long working hours, hand-harvesting, handwashing, and hand-weeding, was described by some participants almost fondly, noting that it is in a hard day's work that they find satisfaction. Fiscal factors, or competition with other sectors, were not explicitly mentioned as a factor in recruiting or retaining domestic labourers, however, the rising minimum wage and its effect on overall costs was described by three participants. These findings align with a key report put forth by the Canadian Agricultural Human Resources Council (2019) that was also used as the guiding document in the development of the conceptual framework.

4.2.2 THE NATURE OF THE WORKERS

There was a clear divide in the attitudes of those interviewed towards domestic and temporary foreign workers. Of the five participants who reported working with temporary foreign workers, all had done so for many years, and plainly stated that they have come to rely on these workers. One participant reported, “I have people [temporary foreign workers] who come to the farm now, getting on close to 20 years.” Reliance on temporary foreign workers has been longstanding and is well documented in the literature (Canadian Agricultural Human Resources Council, 2019a, 2019b, 2019c; Employment and Social Development Canada, 2021b). These five participants, who worked with both labour groups, highly praised the work ethic and abilities of temporary foreign workers, commenting, “they are here to work” and “they know how to work.” As these workers often returned year after year, they were experienced and required less training. Another participant stated, “We wouldn't be able to survive without that program” referring to the Temporary Foreign Worker Program. In contrast, domestic workers typically required more training, had a sense of entitlement, and did not have an appreciation for a hard day's work like their temporary foreign worker counterparts. The remaining two participants reported primarily positive experiences in employing and working with domestic workers.

The research gathered from farmer interviews showed that domestic workers, particularly young domestic workers, were showing increasingly less interest in agricultural labour, something that impacted their work ethic and attitudes on the farm. This contrasted the generally ‘hard working’ attitudes that farmers perceived in their temporary foreign workers. Young domestic workers were less likely to return year after year, often employed for a season or two during their summer break, before graduating and entering a different sector of the workforce. One participant noted:

“I want to do something that I'm proud of at the end of the day, and they [temporary foreign workers] really are concerned about doing the job. In the Canadian workers it's quite varied. I've gone from a time when I really looked forward to the summer crews when we started, because almost invariably you would have kids that came and went. You would coach them and get them to do what needed to be done. Then you would see that moment when they went ‘Oh, my God look what I'm capable of’, and then that began to deteriorate over time and it's now uncertain whether they will ever achieve that. Some kids do. You know I don't know whether it's their background, or is just their personality, and who they are at their core. But other kids don't, they continue to be ‘Oh, God, how long is it till quitting time? Just get me out of here’, and they never get past that which is sad, because I see a lot of really capable kids who are really underselling themselves, just have no idea of who they really could be if they applied themselves.” – Interviewee One

For both working groups, a preference was given to experienced workers who returned year after year. Notably, these employees helped to train others, increasing farm efficiency as they were highly skilled, and in some cases act as leaders for other employees. One participant noted, “Training is a huge cost so having the same workers return is more efficient.”

4.2.3 THE ROLE OF TECHNOLOGY IN MEETING LABOUR DEMANDS AND INCREASING EFFICIENCY

All participants engaged in the use of labour-saving technology in order to reduce costs and increase efficiency. Technology ranged from weeding robots, to sorting machines, to self-propelled picking platforms. As identified in the literature and re-emphasised by the research, horticultural farmers, unlike their monocropping counterparts, required a variety of different technologies corresponding with their variety of crops (Canadian Agricultural Human Resources Council, 2019a; RBC Thought Leadership, 2019).

High capital investment was cited as a barrier in accessing labour-saving technologies. Despite high costs, technology was framed as the only alternative for harvesting when the labour supply was low. While hand-harvested products were often of a higher quality and could therefore be sold at a higher price, farmers did not always have this option due to labour constraints and had to turn to expensive technological solutions for harvest. In addition to the up-front costs paid by farmers, there were ongoing expenses like machine maintenance and upgrading.

“We're hell bent on mechanizing, and yes, it's expensive. It's also frustrating just to get your hands on the right stuff period. I've been buying a lot of things out of Europe because North America is in the stone age basically. So, it's been a real challenge that way but if we're going to survive, we've got to.” – Interviewee Five

These ongoing expenses were also associated with lost production time. Along with high-capital costs, the unfavourable ‘buggy’ nature of technology was noted by participants whereby days of work were lost when machines weren’t working as intended or were awaiting repairs. Participants spoke to the development cycles of technology with both excitement and frustration, noting that they were too long. One farmer had direct involvement with start-up tech companies, and trialed new technologies on their farm and offered feedback.

Despite its drawbacks, participants noted that technology did increase farm efficiency. It allowed farmers to meet their unmet labour needs and supported labourers in working faster. As the cost of labour and other farm inputs continue to rise, described further below, farmers substituted growing costs, like that of hand-weeding, with the cost of technology.

4.2.4 LABOUR PLANNING

Access to labour, labour planning and the hiring process has changed over time. Historically, these farms were primarily staffed by family members, neighbours, students and retirees, but these labour pools have since dwindled. This aligns with concepts of rural depopulation and domestic worker values (Canadian Agricultural Human Resource Council, 2015; Canadian Agricultural Human Resources Council, 2019a; Rotz, Gravely, et al., 2019).

“I actually had an odd thing that happened in the last round of advertising. I had a Canadian apply - that hasn't happened for 2 or 3 years. Every time I advertise, I get somewhere between 30 and 50 overseas applicants who are probably capable of doing the

work, but by time they got through the paperwork, my season would be over, and that would be of no use to me.”- Interviewee One

A lack of access to skilled domestic workers led farmers to turn to the Temporary Foreign Worker Program for much needed labour support. As described previously in this chapter, participants shared that they have come to rely on temporary foreign workers and that many would not be able to get by without them. The application process for hiring a temporary foreign worker was considered a necessary but tedious step, described as a difficult to navigate, expensive and long process without guarantee that workers will arrive on time or at all. Whether farmers met program requirements, like adequate worker housing, was not disclosed until they were not approved for the program, wasting valuable hiring time and forcing farmers to restart the application process. Assistance for farmers navigating this program was one recommendation that came from the research. While overly regulated, one participant noted that transparency on the stages of the application process had improved.

A variety of hiring practices were demonstrated including the use of hiring websites like Indeed.com, social media, student fairs, and word of mouth. As hiring domestic and temporary foreign workers has become more challenging, so too has hiring for management positions. Six participants spoke on succession planning and hiring for management positions. Two hired and trained relatives to take on management positions. One participant, who did not have family able and willing to take on management positions, hired a temporary foreign worker with a return of service contract, and supported the worker in obtaining their permanent residency. For others, farm succession was cited as a problem they had not yet solved. This wasn't for lack of trying, but rather as they have been unable to find qualified candidates.

4.2.5 CONSUMER PERCEPTIONS OF AND INTEREST IN FARMING

Consumer perceptions and interest in farming have both positively and negatively impacted these farm businesses and their ability to recruit labour. The research shows that there is some renewed public interest in seeing where their food comes from. This includes agritourism activities that bring families to the farm like u-picking operations. One participant noted that there was interest in working in the field whereby domestic workers employed a “we're all in this together attitude” following the onset of the COVID-19 pandemic (Interviewee 5). While this was deemed timely for farmers who saw a delay in the arrival of temporary foreign workers due to travel restrictions, this interest was short-lived.

“They're professional. They do this year after year after year after year, and it really irks me that the Government calls it ‘unskilled labor’. It is absolutely skilled - just because sitting in an office you don't understand what these guys do out in the field.”- Interviewee Five

It was reported that negative public and government perceptions impacted worker recruitment. This included the perception of farmers and labourers as “losers” and as unskilled. Other

negative public perceptions discussed related to the rising cost of food and the negative portrayal of Temporary Foreign Worker Programs in the media. Participants described the rising cost of food as a long time coming, given the suppression of food prices to match international competition, and the thinning profit margins experienced by farmers. The negative impact the media's portrayal of the Temporary Foreign Worker Program had was twofold as described by participants. Some participants noted that the mistreatment of temporary foreign workers, while inexcusable, had not been uniform across the profession and has created a poor reputation for farmers and the Temporary Foreign Worker Program. Conversely, farmers felt they were criticized for hiring temporary foreign workers over domestic workers, despite having to complete a Labour Market Impact Assessment before bringing on these workers and that the program had not caused job displacement or wage suppression at the national level in Canada (Employment and Social Development Canada, 2021a). Public perceptions along with the other themes described in the chapter influenced job-satisfaction experienced by farmers, described further in the section below.

4.2.6 FARMER VALUES AND JOB SATISFACTION

Literature on farmer values and job satisfaction identified that Canadians view farmers as value driven and hard-working—these sentiments were corroborated by participants, with a strong sense of farmer values emerging from the data (Agriculture and Agri-Food Canada, 2021; Phoenix Strategic Perspectives Inc., 2017). These values guided the way in which farmers operated and interacted with their employees. This included paying workers a living wage instead of minimum wage and cultivating friendly relationships with workers and their families, even those family members abroad. Farming in a sustainable way was also cited as important, with one farmer choosing to pay for more labourers instead of more efficient but fossil fuel dependent technologies.

“We are very much environmentalists, so there's a lot of technologies out there that are just like another fossil fuel addition, and we try to avoid that as much as we can. We obviously can't avoid it fully, but we try to. This is also the reason I have so much labour.” – Interviewee Three

“I've always felt that I should do something for people who were less fortunate, and one of those things is bringing in people [labourers] from offshore. I've gone to their house, I know where they're coming from, and I feel that I had the advantage of having a place where I could employ them.” Interviewee Six

“Farming has to be something you're passionate about, and we are. It's a challenging occupation but it's important, you know? And I do hope that people realize the importance of it, and what goes into growing that bag of apples or potatoes, or the work behind it, and all the people that it takes.” – Interviewee Seven

Overwhelmingly, participants identified that agricultural work is challenging, leaving some unsure about their choice to enter the field. As a result of these challenges, they noted that farmers have suffered. One participant noted that working on the farm alone was not profitable, requiring them to work a full-time job elsewhere. Finally, a sense of powerlessness was reported by some respondents who attributed this to farmers becoming a smaller percentage of the voting population, muting their voices and ability to reach public officials and law makers.

Despite these challenges, participants remained passionate about their work. They described a sense of accomplishment, purpose, worth and satisfaction, with many suggesting that Canadians too could have this, going so far as to suggest that this was lacking in the mainstream workplace.

4.2.7 EXTERNAL CHALLENGES IMPACTING LABOUR

The effects of climate change, COVID-19, government interventions and increasing costs were all described as major challenges. The impacts of these challenges on labour recruitment and retention were unexpected. Unlike the themes discussed above, these were broad and indirectly impacted labour planning.

4.2.7.1 CLIMATE CHANGE. Climate change was described by three participants as the greatest short- or long-term challenge on the farm. The unpredictability of weather events was described by participants as a barrier in adequately planning their labour force for the season.

Unpredictable weather events included late frosts, temperate and delayed harvest seasons, floods and droughts. These weather events made it challenging for participants to predict when their peak season would be, how many labourers they would need and at what times, and what roles they would be doing. They have also led to uncertainty surrounding profits as the quantity and quality of crops suffer. The unpredictability of climate change and uncertainty surrounding labour planning and profitability was also described in the literature (Agriculture and Agri-Food Canada, 2020).

4.2.7.2 COVID-19. The COVID-19 pandemic also impacted participants' ability to recruit and retain labourers. In March 2020 during the onset of the pandemic, during what should have been the beginning of the planting season, they were unable to get the temporary foreign workers that their farm businesses relied on. This delay was attributed to strict travel, quarantine, and housing regulations. The wait for the arrival of temporary foreign workers was longer for some than others. The delay in worker arrivals required creativity and farmers were forced to pivot, changing how they conventionally operated their farms. Some participants described of having to think of a, "Plan B" that they fortunately did not have to implement when their workers arrived only a short time later. Others called on their local communities, hiring neighbours, students and friends to start their planting season. In some cases, participants turned to technology as a labour replacement, although this was out of necessity rather than preference. They noted that the demand for labour-saving technology during this period was greater than the supply, and that it was not a perfect substitution.

4.2.7.3 GOVERNMENT OVERSIGHT. While government regulations regarding COVID-19 were cited as a significant challenge for farmers in the recruitment and retention of agricultural labourers, this was just one aspect of government oversight that was generally unwelcomed. The research showed that government interventions, including regulations, inspections, and paperwork, have become increasingly administratively burdensome. Participants described that their owner and operator roles had become increasingly office oriented, a challenge when they felt their expertise was better utilized in the field. Government regulation permeated all aspects of agribusiness, from hiring labourers, to housing requirements for temporary foreign workers, the price of food, food safety, and global competition in the market. As such, farmers have had to increasingly interact with various government bodies and organizations, but they also noted that doing so is challenging. Along with the administrative burden, farmers have had to learn to navigate these challenging and complex systems. This has proven a barrier for some, with one participant noting the complexity of the Temporary Foreign Worker Program prevented them from accessing this group of vital workers.

4.2.7.4 INCREASING COSTS. The final external challenge inadvertently impacting the recruitment and retention of labour were the rising costs of farm inputs, noted by all participants. The research shows that the challenge lies in that farm inputs have increased while farmer income has remained unchanged. The rise in the cost of labour, just one of these farm inputs, was multifactorial. Minimum wage had increased while requirements surrounding the Temporary Foreign Worker Program, like inspections and housing, had changed. One participant noted that their workers, all domestic, were paid a living wage instead of the required minimum wage, and said, “That’s a cost we have to take for, you know, living with what I believe are decent values” (Interviewee 3). The cost of other farm inputs like fertilizer and technology were impacted by global supply chain constraints. Participants noted the cost of food does not accurately reflect the cost of the farm inputs required to produce it, stating this was the result of both global food market competition and large mono-cropping agribusinesses driving down prices that small farms cannot match. As a result, they have turned to some other creative solutions to ensure profits.

4.2.8 OTHER OPPORTUNITIES

The hard-work and challenges associated with farming are numerous, but so too are the opportunities being pursued by farmers. Participants have found creative solutions to the farm-labour and other problems, diversifying the types of work available on their farms. Some have turned to the expansion and diversification of products to create reliable income streams, like creating a cider line or starting a cut-flower business. The ways that farmers can interact with and sell to customers has changed, including online stores, brand-new on-farm markets and CSA programs. Rebranding as an agritourism destination and expanding on farm capacity to process products are other solutions that have been promising for keeping business steady. Directly and indirectly, these changes have created desirable jobs for workers that meet some of the

challenges associated with agricultural labour in horticulture; jobs that are less physically demanding, more permanent and with steadier working hours.

4.3 Summary

Eight distinct themes emerged from the research: the challenging nature of horticultural work, labourer attributes as perceived by farmers, technology, labour planning, public perceptions of farming, farmer values and job satisfaction, external challenges impacting labour recruitment and retention, and other opportunities being pursued by farmers. While farmers are resilient, these themes highlight the mounting uncertainties and complexities that threaten family and co-operatively owned horticultural farms in Canada.

Chapter 5: Discussion and Conclusions

This research set out to understand how farmers in British Columbia and Nova Scotia viewed the potential for domestic workers, temporary foreign workers, and technology to meet labour demands. This included investigating (1) advantages and disadvantages of each labour group as perceived by farmers and (2) barriers and possible solutions to recruiting and retaining domestic or temporary foreign workers or implementing new technologies. Eight themes emerged from the research that began to answer these questions. However, in attempting to answer these questions, it became clear just how complex the agricultural labour problem is. It is a multifactorial problem and as such, no one intervention will be sufficient in ensuring a stable supply of agricultural labour. This final chapter answers the research questions and in doing so, explores the uncertainties that make the agricultural labour problem so complex, and the resulting policy implications.

5.1 Answering the Research Questions

LABOUR GROUP ADVANTAGES AND DISADVANTAGES

Overall, the perception of domestic workers from this sample was that they were not a dependable source of labour. They were difficult to recruit and to retain due to the physical, geographical, temporal and fiscal factors outlined in the conceptual framework, and were often less experienced than temporary foreign workers. In addition to these factors, it is possible that the career experiences sought by Canadians no longer align with the ones offered, or are perceived to be offered, in the horticultural sector, making it challenging for farmers to find domestic labour. This was evidenced by the lack of interest and skill in farming by young family members and young domestic workers. One implication of this might be that there is a lack of public knowledge surrounding the types of horticultural labour jobs available, and the benefits associated with these jobs. Increased awareness may change the negative public perceptions that dissuade Canadian's from thinking of agriculture as a viable career. These findings align with what was known about domestic workers preferring permanent full-time employment over physically laborious, rural, and seasonal positions (Canadian Agricultural Human Resources Council, 2019a; Rotz, Gravely, et al., 2019).

Temporary foreign workers continue to be an integral part of the agricultural workforce. They were perceived as being reliable – they were skilled, hard-working, and often returned year after year. All five participants who hired temporary foreign workers noted just how much their farm businesses have come to rely on these workers, aligning with the literature (Esses et al., 2021; Falconer, 2020; Otero & Preibisch, 2015; Weiler, 2018; Weiler et al., 2017). Reliance on temporary foreign workers did not solely arise from a lack of domestic workers, but from strong work ethics and experience in the field that, for many, has been honed year after year with the same employers. After years of Canadians falling out of the agriculture workforce, domestic workers no longer have the experience and skills that farmers are seeking, unlike temporary foreign workers.

It is important to note that temporary foreign workers are vulnerable; they do not enjoy citizenship rights and as such do not have many protections in the Canadian workforce. While they are perceived as being hardworking in the literature and by participants, temporary foreign workers have had to make themselves indispensable by working hard, or risk not returning in subsequent years (Otero & Preibisch, 2015; Preibisch, 2010; Weiler et al., 2016).

The drawbacks of relying on temporary foreign workers stemmed largely from how administratively burdensome the Temporary Foreign Worker Program was. This proved to be a barrier to entry for the program and challenge throughout its utilization due to regulatory requirements like costly inspections and paperwork. This is paired with increasing uncertainty surrounding when workers will arrive, due to both external factors like travel restrictions and internal factors like failing a Labour Market Impact Assessment application. Overall, participants called for more government assistance in navigating this necessary program and less government oversight including regulations and paperwork. This aligns with findings from a 2021 review conducted by Employment and Social Development Canada. This review found that challenges related to the program and specifically the Labour Market Impact Assessment had hindered the effectiveness for some, and that administrative and financial barriers have prevented some farmers in accessing the program (Employment and Social Development Canada, 2021a). This sentiment was echoed by one farmer who was interviewed, who went on to note that while they would benefit from employing temporary foreign workers, they simply did not know how, where, or when to get involved with such a complex and daunting program. Through Budget 2022, Employment and Social Development Canada announced changes to address these challenges by protecting the rights of workers, that included providing reasonable access to healthcare services, and introducing a Trusted Employer Model that reduces the administrative workload for trusted repeat employers (Employment and Social Development Canada, 2022). While it was previously known that the Temporary Foreign Worker Program was administratively burdensome for farmers and challenging to navigate, participants in this study emphasized just how much this impacted their workload. For owners and operators, a significant amount of time was spent on labour planning for future seasons, including the copious amounts of paperwork that tied farmers to their desks when they felt they were needed in the field.

Labour-saving technology and automation were perceived to increase efficiency and to supplement farm labour. It is important to highlight that that this group of farmers used technology to supplement farm labour, and not to displace workers, as was described as one of the ethical implications of implementing technology in the literature (RBC Thought Leadership, 2019; Rotz, Duncan, et al., 2019; Rotz, Gravely, et al., 2019). Participants noted that disadvantages of technology were that it was difficult to obtain due to high capital costs, supply chain issues, including that Canada did not produce enough ag-tech, and that development cycles were slow, aligning with the literature (Aubert et al., 2012; Blais et al., 2021; RBC Thought Leadership, 2019; Rotz, Duncan, et al., 2019). The ‘buggy’ nature of technology that required frequent and costly repairs and the subsequent inefficiency was attributed to these slow

development cycles. With skilled agricultural labourers becoming increasingly scarce and expensive to hire, interviewees had a definite interest in labour-saving technology to increase efficiency on the farm. However, the technology simply was not as efficient or reliable as participants wanted it to be, especially given the significant cost of the technology. This included the upfront financial costs, but also production delays when equipment required repairs or maintenance, something that aligned with the literature (RBC Thought Leadership, 2019). To increase the uptake of technology on horticultural farms, increased access to technology, financial support, and technology efficiency will be needed. Work in this vein is already underway through the 2022 federal announcement of funding to support Canadian ag-tech businesses and through the Agricultural Clean Technology Program (Agriculture and Agri-Food Canada, 2022a, 2022b). This program enables the development and adoption of clean technology through funding for farmers and developers.

This research has explored how horticultural farmers perceived the advantages and disadvantages of the different labour groups. However, this is not to imply that any group is inherently better or worse than another, or even that this impacts which labour groups that farmers source from. Indeed, the lack of domestic workers, and the challenges in employing temporary foreign workers and technology has meant that farmers have had little choice in their labour planning. A reflection of how dire the agricultural labour problem is, farmers are not willfully choosing one labour group over another based on their perceived advantages and disadvantages, but instead are utilizing all groups to meet labour demands. Despite this, the labour shortage remains, and more support is needed for farmers. Understanding the advantages and disadvantages of each labour group as perceived by farmers is useful for policy makers looking to address recruitment and retention challenges specific to each labour group. However, the agricultural labour problem is complex, made more so by the uncertainties that impact labour planning.

RECRUITMENT AND RETENTION BARRIERS AND SOLUTIONS.

Interviewees identified the biggest barrier in recruiting domestic workers as the lack of qualified applicants from this labour pool. Participants noted that domestic applicants were rare and were often underqualified. This is unsurprising given that domestic workers have been steadily leaving rural agricultural work for metropolitan-based positions (Canadian Agricultural Human Resources Council, 2019a). Barriers in retaining domestic workers related back to the physically challenging and temporal nature of the work, echoed in the literature (Canadian Agricultural Human Resources Council, 2019a). Conversely, farmers felt that there had been no shortage of qualified foreign workers seeking agricultural labour jobs in Canada, however, the biggest barrier in recruiting these workers went back to the administratively burdensome and difficult to navigate processes to hire these workers. There were few barriers faced by farmers seeking to retain temporary foreign workers, with many of these workers returning year after year. As described in the previous section and aligning with the literature (RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019), the major barriers preventing the adoption and implementation

of labour-saving technology and automation were the high capital costs and supply chain constraints.

Domestic workers were inherently the first labour source accessed by the farmers interviewed. This is the result of the structure of the Temporary Foreign Worker Program and subsequent Labour Market Impact Assessment, ensuring that farmers first hire capable domestic labourers before hiring foreign labour. Even though this labour matching system preferentially supports the hiring of domestic workers, farm labour positions are not being filled by Canadians. Increasingly, participants have created job postings for domestic workers only to meet Labour Market Impact Assessment requirements, all the while knowing that they would not receive experienced applicants, something that was not identified in the literature. Participants felt that advertising positions to domestic labourers was a formality; it was viewed as a step in the process for the hiring skilled temporary foreign workers. Five out of the seven participants did not expect to secure labourers with adequate experience when advertising domestically. Given current labour market shortages across all sectors, and not just agriculture, it seems unlikely that the lack of skilled domestic applicants will change without intervention. Given this context, two interventions might be considered by policy makers.

The first is to develop and expand current agricultural training programs in Canada, and to market agricultural labour as a viable and sustainable career, as recommended by the Canadian Agricultural Human Resources Council (2019a) and reinforced by this research. Presently, diploma and degree programs exist in British Columbia and Nova Scotia that focus on agrology, horticulture technology, sustainable agriculture, and agricultural sciences just to name a few. The second, and perhaps more feasible option given the recruitment and retention challenges inherent to farming (i.e., ruralness, physicality, and seasonality), is to simplify the process for farmers accessing temporary foreign workers. As participants felt that advertising positions to domestic workers was an administrative necessity before accessing valuable temporary foreign workers, it is understandable why they might want this lengthy and administratively burdensome aspect removed or streamlined. To address this, work is underway to develop a Trusted Employer Model that will support trusted repeat employers in hiring temporary foreign workers (Employment and Social Development Canada, 2022).

Solutions to these recruitment and retention issues are challenging to identify, especially as these challenges have been exacerbated by factors external to the labour groups themselves and are not linked solely to the advantages and disadvantages of hiring and working with each labour group. These external factors include climate change, COVID-19, increasing costs, and government oversight, as described in chapter four.

5.2 Unexpected Findings and Reimagined Conceptual Framework

This research corroborated much of what was already known about the agricultural labour shortage in Canada. These findings, including factors that influence the recruitment and retention of different labour groups, were reflected in the original conceptual framework, that was developed from the Canadian Agricultural Human Resources Council (2019a) key report, *How Labour Challenges Will Shape the Future of Agriculture*. However, participants identified several external factors that significantly impacted labour planning: Climate change, COVID-19, government oversight, and increasing costs. Some of these challenges were well known and documented in the literature – that climate change is shifting growing seasons (Agriculture and Agri-Food Canada, 2020), that COVID-19 prevented vital workers from entering the country (Polsky & Gilmour, 2020; Statistics Canada, 2020), and that farmer profit margins were threatened by increasing costs and their inability to pass these costs onto customers (Blais et al., 2021; Canadian Agricultural Human Resources Council, 2019a) . What was not expected was just how much these factors impact labour planning in relation to the commodity and labour group characteristics, further adding to the financial risks involved with owning or operating a farm.

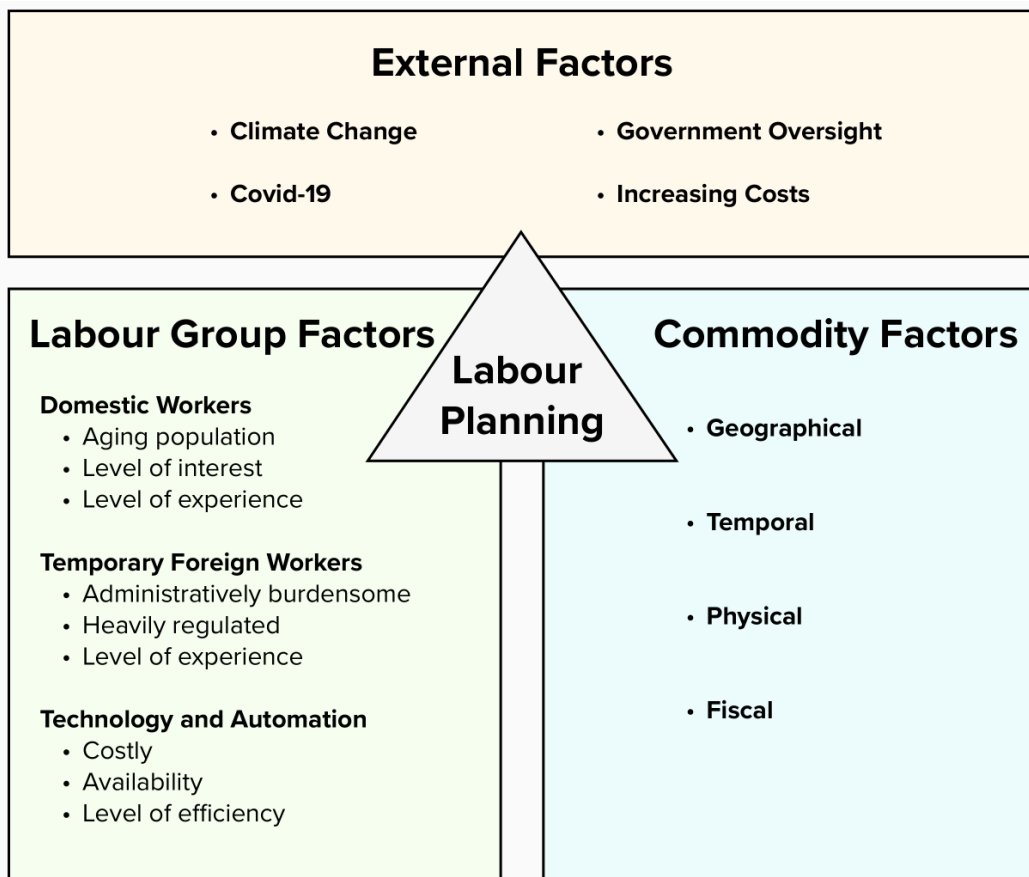
Farmers assume significant financial risks that are inherent to farming and out of their control, demonstrated in both the interviews and the literature (Kahan, 2008; OECD, 2020a, 2020b) . They invest time and money during the planting season for a return on their investment come the harvest season. This risk has been increased immensely by the labour problem and factors that negatively impact labour planning. Farmers hire costly labour, jumping through administrative hoops in the process, hoping that the season is not interrupted or shifted by climate disasters, and ensuring that their workers have neither too much nor too little work to do. When considering all the factors identified that impact each of the labour groups, farmers are trying to plan their labour force around unexpected events. In order to remain efficient, farmers must do the increasingly impossible task of ensuring they have the right amount of skilled labour, at the right times, or else risk not having a successful harvest. Therefore, farmers may benefit from increased risk-management and mitigation support. As with all of the recommendations that are to follow, it is important that this work be done without increasing the administrative burden that these farmers spoke of as ‘chaining them to their desks’, when they would rather be out in the field working.

Work is underway to address the financial risks assumed by farmers, further exacerbated by market, production, human resources, and policy risks. The Lower Mainland Horticultural Improvement Association offers seminars on agricultural risk management in British Columbia (Government of British Columbia, n.d.-b). The Nova Scotia Federation of Agriculture piloted the AgriRisk project, that developed risk assessment tools for farmers in the grape and wine industry (Nova Scotia Federation of Agriculture, 2018).

As this research has been rooted in Interpretivism and employed an inductive approach to gathering and understanding the data, the conceptual framework was expanded to include these

unexpected findings. The updated conceptual framework is more representative of the challenges that this group of farmers perceived as being significant barriers in their ability to successfully plan their labour force. It now frames the agricultural labour problem from a broader labour planning perspective and includes external factors impacting labour planning.

FIGURE 2: REDESIGNED CONCEPTUAL FRAMEWORK - FACTORS IMPACTING LABOUR PLANNING FOR HORTICULTURAL FARMERS IN B.C. AND N.S.



(Author's own elaboration)

5.3 Recommendations

The agricultural labour problem is dire, but farmers have shown resilience and creativity in responding to this crisis. However, increased supports are needed if family and cooperatively owned horticultural farms are to remain viable against large agri-business competitors. This research has shared the perspective of how horticultural farmers in British Columbia and Nova Scotia view the potential of different labour groups to meet labour needs and offers the following summarized recommendations:

1. TO RECRUIT AND RETAIN DOMESTIC WORKERS.

To bolster domestic worker skills and increase awareness of careers in the agricultural sector, post-secondary institutions can develop and expand agricultural training programs. While this option has the potential to increase the number of skilled domestic labourers in Canada, it will not necessarily increase the number of Canadians that are interested in working in the sector, nor would it be guaranteed that there would be students interested in these programs. The lack of skilled domestic workers was just one challenge identified in the literature and by participants; it was also the physically laborious, seasonal, and rural nature of the work that dissuaded Canadians from joining the sector.

The farmers interviewed had incorporated technology to meet labour needs and increase efficiency on their farms, and while not the primary goal, this also changed the nature of the work. While agricultural labour will always remain physically laborious, the implementation and adoption of technology makes it less so. Operating this technology will require a different skill set and training than traditional agricultural labour roles, as identified in the literature (RBC Thought Leadership, 2019). Similarly, while agriculture will always be seasonal in nature, participants had worked to create steadier working hours for their staff by planting different crop varieties that were harvested at different times in the season, and by developing other business opportunities like agritourism. What farmers will not be able to address without government intervention are the issues of ruralness that dissuade Canadians from taking up careers in the agricultural sector.

With rural depopulation an ongoing challenge in Canada, not just as it relates to agriculture, work has been done to understand these trends and the concept of rural attractiveness. The Canadian Rural Revitalization Foundation is one such organization that has conducted this research. Through this work, they identified that lack of access to reliable services and technology, including health care, schools, and internet, was one indicator dissuading Canadians from moving to rural or remote areas (2021). Factors that might contribute to counter urbanization, or migration from urban to rural areas, include rising housing prices in urban centers and the marked increase of working-from-home capabilities since the onset of the COVID-19 pandemic (Breen & Robinson, 2021; Foster et al., 2021). Given these factors, farmers may have access to an increased domestic labour pool. Government intervention to

increase the attractiveness of rural and remote locations, like ensuring adequate service provision and leveraging trends of counter urbanization, would benefit farmers and rural communities.

2. TO SUPPORT FARMERS IN HIRING TEMPORARY FOREIGN WORKERS.

Research shows that the Temporary Foreign Worker Program is administratively burdensome and challenging to navigate (Employment and Social Development Canada, 2021a, 2022), something that was re-emphasized by the farmers interviewed for this study. Work is already underway to streamline this process (Employment and Social Development Canada, 2022), and further supports for farmers who are new to navigating this program would also be beneficial. It is evident through literature and echoed through this research that the Canadian agricultural sector is reliant on this program. COVID-19 pandemic related border closures demonstrated how disruptive the absence of vital temporary foreign workers was and in the wake of pandemics, epidemics, climate change, and global civil unrest, planning for the potential of future borders closures or the inability of temporary foreign workers to travel to Canada may be necessary.

While the Temporary Foreign Worker Program has remained incredibly valuable in keeping Canadian farms functioning, it will be important for governments and those in the sector to remember the ethical implications the program has. Much research has been done on the mistreatment of temporary foreign workers, the effects the program has had on the communities from where these workers come from, and the exploitative nature of the program (Binford, 2019; Caxaj & Cohen, 2021a, 2021b; Colindres et al., 2021; Falconer, 2020; Strauss & McGrath, 2017; Weiler, 2018; Weiler et al., 2016, 2017). Knowing this, there is an ethical duty for policy makers to ensure that changes or improvements to the program do not exacerbate these existing inequalities, and to continue work in the realm of protecting temporary foreign workers, for example, through citizenship pathways.

3. TO INCREASE THE UTILIZATION OF LABOUR-SAVING TECHNOLOGY.

As identified in the literature (Aubert et al., 2012; Blais et al., 2021; RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019) and by participants, barriers in the adoption and implementation of technology include high capital costs and the buggy nature of the technology. Financial support for farmers looking to increase farm efficiency and meet labour needs by using technology is important, and several funding programs do exist. These include the federal Agricultural Clean Technology Program that provides funding to both consumers and developers (Agriculture and Agri-Food Canada, 2022a, 2022b). British Columbia offers the Knowledge and Technology Transfer program that, while not specific to just ag-tech, provides agriculture and food associations, not for profits, and municipal and regional districts with funding (Government of British Columbia, n.d.-a). Further funding has been granted to ag-tech companies in British Columbia through the B.C. Centre for Agritech Innovation (Ministry of Agriculture and Food, 2023). In Nova Scotia, farmers can apply for funding through the Technologies for Value-Added Agriculture and the Advancing Innovative Technologies programs (Government of Nova Scotia, n.d.-b, n.d.-a). While funding that supports both farmers investing in technology and ag-

tech companies developing and improving technologies could assist in increasing farm efficiency and meeting some labour needs, researchers have identified this should be done in a responsible way that does not exacerbate the financialization of the food system, for example, by not supporting primarily large mono-cropping farm businesses (Stevens, 2022; Stevens & Clapp, 2021).

Finally, as described previously, the implementation of technology will, in some cases, change the role of the agricultural labourer, and will require training. As identified in the literature, this is something that could make agricultural labour positions more favourable for domestic workers, but there also remains a moral obligation to include temporary foreign workers in the ‘technological revolution’ by training and up-skilling these important workers and support them in the transition from ‘low-skilled’ to ‘high-skilled’ workers (Gallardo & Sauer, 2018; Marinoudi et al., 2019; RBC Thought Leadership, 2019; Rotz, Gravely, et al., 2019).

4. TO SUPPORT FARMERS IN MITIGATING AND MANAGING THE EXTERNAL RISKS THAT IMPACT LABOUR PLANNING.

Farmers have faced increased uncertainty in their labour planning due to climate change, increasing costs, and government oversight and regulation, further adding to the financial risks they assume each season. While some programs are in place that aim to educate farmers on risk management (Government of British Columbia, n.d.-b; Nova Scotia Federation of Agriculture, 2018), these are relatively new and place the onus on the farmer to manage and assume risk. Other initiatives exist that support farmers in navigating changes related to climate change, like the Climate & Agriculture Initiative BC, that have developed guides for managing and adapting to specific risks such as pests, flooding, and droughts to name a few (BC Food Web, n.d.).

To support farmers when they cannot manage or mitigate these risks alone, cost-shared programs exist between the federal, provincial, and territorial governments. These programs include income protection and crop insurance against weather events and wildlife damage. Little research is available on the effectiveness of crop insurance in protecting farmer livelihoods in Canada or on farmer experiences with and perceptions of these cost-shared programs. Future research is needed to understand how these programs could best support farmers, and what measures could be taken, if any, to protect farmers not just from crop damage or market volatility, but also from the impacts of the agricultural labour shortage.

Despite identifying recommendations to support horticultural farmers in recruiting and retaining labour-groups, an important catch-22 remains; while family and co-operatively owned farms are struggling and would benefit from government support, government oversight and regulation has been perceived by farmers as being restrictive in their ability to successfully labour plan. Further, with the decline of experienced domestic applicants, farmers have come to rely on temporary foreign workers in spite of the broader exploitative nature inherent to the Temporary Foreign Worker Program, with little recourse to alternatives. Successfully navigating this juxtaposition will rely on governments, policymakers, and farmers working together to identify solutions that

support farmers and protect the rights of temporary foreign workers without increasing the complexities farmers already face.

5.4 Limitations and Future Research

While important, this research is based on data obtained from a small sample size of family and co-operatively owned horticultural farms in British Columbia and Nova Scotia. Therefore, this data is not representative of all farmers and as such, results cannot be widely applied to the agricultural labour problem in Canada.

This research fills an important gap in the literature, adding the perspective of horticultural farmers in British Columbia and Nova Scotia on the labour problem, and the potential of different labour groups to meet labour demands. Due to the complexity of the challenges impacting labour planning, and of how dire the labour problem has become, there is no one labour group that is poised to meet labour demands. Instead, it will likely require dynamic blend of all working groups and increased government supports. To support this, future research might turn to labour planning models that include all three labour groups and that could be applied to a larger group of horticultural farmers. Of course, this research should require the inclusion and perspectives of both farmers and labourers.

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Appendix A: Recruitment Emails

A.1 Initial Recruitment Email

Dear *name*,

I am leading a research project titled "**All hands on deck': Agricultural labour in British Columbia and Nova Scotia.**" The purpose of this research is to understand how farmers (owners/operators) in both British Columbia and Nova Scotia view the potential of domestic workers, temporary foreign workers, and technology in meeting growing agricultural labour needs.

I am writing to ask if you would be willing to participate in a 30-minute interview (Via Zoom or telephone). If you would prefer to provide a written response the questions can also be sent to you over email. The questions would focus on your experience recruiting and retaining farm workers and your perceptions of the growing labour-gap in agriculture.

If you are interested in participating, please let me know and I will send you some days and times that might work. If you are not interested, please reply 'no' to this email and I won't bother you again.

Many thanks for considering. I welcome any questions you might have about the study and research process.

Thank you and all the best,

Amanda Leclerc

A.2 Follow-up Recruitment Email

Dear *name*,

I am writing again to see if you might be willing to participate in the research study outlined below. If this is something you are interested in, please let me know and I will send along some dates and times that might work for a short interview via Zoom, telephone, or over email.

Thank you and all the best,
Amanda Leclerc

Appendix B: Consent Form

Participant Consent Form

You are invited to participate in a study entitled “**All Hands on Deck': Agricultural Labour in British Columbia and Nova Scotia**” that is being conducted by Amanda Leclerc.

Amanda is a student completing her Masters Thesis in the School of Public Administration at the University of Victoria, British Columbia.

Purpose

The purpose of this research project is to understand the perspective of farm owners and operators regarding the agricultural labour gap and of three different labour groups – domestic workers, temporary foreign workers, and labour-saving technologies and automation. This work aims to inform both academic research and policy practice in Canada.

Participant Selection

You are being asked to participate in this study because you are a farm owner or operator who may have experience working with domestic workers, temporary foreign workers, or in using labour-saving technologies or automation.

Participant Involvement

If you agree to participate in this research, your participation will entail a semi-structured 30-minute interview via Zoom or telephone with audio recording, or will entail providing a written response to interview questions.

Compensation

There is no financial compensation for your participation in this study.

Risks

There are no known or anticipated risks to you by participating in this research.

Benefits

Participants will have the opportunity to provide their insights, knowledge, and experiences about the agricultural labour gap, different labour groups, and possible solutions to meeting

labour needs. This research has the potential to inform government decisions around new and existing public policy on agricultural labour.

Voluntary Participation

Your participation in this research is completely voluntary. If you decide to participate, you may withdraw at any time without consequence or explanation. You have an absolute right to: (1) withdraw at any time for any reason; (2) not to provide a reason or rationale for withdrawing.

Anonymity

Your name will not be disclosed to anyone at any time. However, due to the nature of this research it is impossible to guarantee your anonymity. Anonymity may be limited as we will be identifying the type of farm you have and whether it is in British Columbia or Nova Scotia. Therefore, people who know you have participated in this study may be able to ascertain your identity, even if your identifying characteristics, such as your name and farm name, are removed or altered.

Further, you may choose to have either an attributable, attributable with anonymity, or a non-attributable interview. The different types of attribution are defined below. If you choose to participate in this research, please circle which attribution type you prefer. If you select an attributable interview, you may change your selection to attributable with anonymity or non-attributable at any time until June 15th, 2022. After this time, your attribution selection may not be changed. Note that quotes are used to enrich the data and allow the researcher to include your thoughts and opinions that might not be otherwise captured in the data.

Types of Attribution (Please indicate the type of attribution you would prefer)

1. **Attributable:** Direct quotes from the interview may be used in this and future research projects using this de-identified data, with a name, province, and farm type attached.
2. **Attributable with Anonymity:** Direct quotes from the interview may be used in this and future research projects using this de-identified data, with no names, provinces, or farm types attached, and will instead read, “- anonymous”.
3. **Non-attributable:** Quotes of any kind may not be used in this or future research projects using this de-identified data.

Confidentiality

The confidentiality of your data will be protected. Interview responses will not identify you by name but will identify you by your farm-type. Electronic copies of the interview notes will be stored on a password-protected project laptop while data is being collected. The laptop will be kept as secure as possible throughout the research. When the research is complete, the interviews will be saved on secure network servers at the University of Victoria. The results will then be removed from the project laptop. Once this project is completed, de-identified data from these interviews will be stored on University of Victoria and Dalhousie University secure network servers.

Dissemination of Results

It is anticipated that the results of this study can be shared with others in the following ways: published articles, theses, books, presentations at scholarly meetings and conferences, and class workshops, and community presentations. A graduate level thesis will be produced with this research and will be available online through the University of Victoria's D-space.

Use of Data

Interview responses will be stored in an electronic form. Interviews from this study may be used by the investigators for future scholarly research building on/expanding on the current project. It will not be used for any other purpose whatsoever. Results from future studies may be shared with others in the following ways: published articles, thesis, books, presentations at scholarly meetings and conferences, and class workshops, and community presentations in participating municipalities. Any future use of data obtained through the interview will be bound by the terms outlined in this form (dissemination, confidentiality, disposal, anonymity).

Disposal of Data

Once the interviews are analyzed and de-identified, they will be permanently stored on University of Victoria and Dalhousie University secure network servers for future use by Dr. Tamara Krawchenko or Dr. Karen Foster.

Funding

This research is not funded.

Contacts

Individuals that may be contacted regarding this study include the graduate student working under the supervision of Dr. Tamara Krawchenko at the University of Victoria, located in Victoria, British Columbia. Amanda's and Dr. Krawchenko's contact information is provided at the top of this form.

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

Participant Consent and Signature

- Taking part in this study is entirely up to you. You have the right to refuse to participate in this study. If you decide to take part, you may choose to pull out of the study at any time without giving a reason and without any negative impact on your relationship with the University of Victoria.
- Your signature below indicates that you have received a copy of this consent form for your own records.
- Your signature indicates that you consent to participate in this study.

Participant Signature

Date

Printed Name of the Participant signing above

Appendix C: Guiding Interview Questions

INTERVIEW QUESTIONS

“All hands on deck’: Agricultural labour in British Columbia and Nova Scotia”

1. *Characteristics of farm:* Could you please tell me a bit about your farm (e.g., size, products, local/domestic versus export market and how long that farm has been in operation)?
2. *Operating environment:* What are the main challenges and opportunities of your farm business now and in the longer term?
3. *Farm labour:* Presently, how many employees does your farm employ in a given year and what type of employees are they (e.g., number of part time, temporary/seasonal versus full time).
4. *Access to employees:* What are your experiences accessing farm labour? Could you walk me through the process that you employ to recruit employees? Do you tend to have the same employees year after year or do they change each season?
5. *Change over time:* How has access to farm labour changed over time in your operations?
6. Have you ever used labour saving technologies or automation on your farm?
7. What are the benefits/drawbacks of working with domestic workers and/or temporary foreign workers (as relevant)?
8. Are these different labour groups easily accessed (ie. easy to find, contact and recruit) by farm-managers in your experience, and if not, how could they be more accessible?
9. What do you see as possible solutions to meeting labour needs on your farm?
10. Is there is any additional information you’d like to share about your experience with recruiting and retaining domestic workers or temporary foreign workers? In using technology to meet labour needs?