

The Story of Agriculture in Niagara, 1969 to Present Day

Introduction

Niagara boasts a temperate climate, rich soil, and convenient access to fresh water. Its unique geography—bookended by lakes Erie and Ontario and sheltered by the escarpment—has made the region especially conducive to tender fruit farming and viticulture (Caldwell 2015; Gayler 1994). Meanwhile, proximity to the Canada-United States border and access to key transportation corridors have also encouraged the growth of poultry and dairy farming. Given these historic strengths, it is unsurprising to see the agriculture and agrifood sector listed as one of Niagara’s “greatest assets” in economic development policy (Niagara Region 2022).

However, Niagara farmers have had to grapple with persistent challenges. Proximity to the Greater Toronto Area has made Niagara vulnerable to urbanization pressures that drive up the cost of land and create problems for farms adjacent to expanding residential areas (Carvalho 2017; Gayler 1994). Farmers face challenges related to climate change, infrastructure, labour, and more. These challenges raise important questions about the future of the agricultural sector in Niagara, all at a time when many Canadian farmers are nearing retirement (Samson 2023). In many ways, Niagara’s agricultural sector is at a critical juncture, and the future of farming in Niagara is unclear.

Even as they face these challenges, farmers in Niagara remain trendsetters in Canadian agriculture. Many are investing in new technologies that boost efficiency and improve productivity (Lemay, Conteh, and Boggs 2021). Others are finding creative ways to capitalize on Niagara’s status as a global tourist hub, driving the growth of farm-based tourism in Ontario (Niagara Region 2022).



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Though there are risks that accompany these changes, and barriers to innovation that are explored below, they are nevertheless cause for optimism.

With this broader context in mind, this working paper explores the evolution of agriculture in Niagara. It focusses on the growth of the agricultural sector post-1969, which is the year that the Regional Municipality of Niagara (Niagara Region) was first incorporated. The paper touches on the challenges that face farmers today, as well as the policies and opportunities that are likely to shape the agricultural sector moving forward.

Agriculture in the Early Days of Niagara Region

The mid-20th century was a transformative period for Niagara agriculture. The expansion of the Queen Elizabeth Way (QEW) highway between 1950 and 1975 made it easier for farmers in Niagara to export goods across Canada and into the United States, while the opening of the Welland Canal Bypass in 1972 provided improved access to international markets (Gayler 1994). International agreements like the Seasonal Agricultural Worker Program (SAWP), implemented by the federal government in 1966, also made it easier to hire migrant workers, providing a critical supply of labour for harvesting and processing goods (Gayler 1994).

The creation of Niagara Region thus coincided with a period of relative growth in local agriculture. Between 1966 and 1972, the total value of agricultural products in Niagara rose by 44 per cent. By 1971, Niagara farms were generating between \$140 million and \$150 million in farmgate sales per year (Niagara Planning and Development 1977). These increases were driven primarily by animal products, greenhouses, and tender fruit and grapes (Niagara Planning and Development 1977). During this time, fruits, vegetables, and greenhouse products accounted for nearly half (46.5 per cent) of the value of agricultural products sold in Niagara, followed by livestock and poultry (33.1 per cent), and dairy and eggs (17.8 per cent) (Niagara Planning and Development 1977). Within Ontario, the region was an especially critical supplier of tender fruits like peaches, cherries, and plums, accounting for over 80 per cent of the tender fruit harvested within the province (Niagara North and Niagara South Federations of Agriculture 1978). Between 1971 and 1972, the value of agricultural sales attributed to Niagara's fruit sector increased from \$19 million to \$32 million (Niagara Planning and Development 1977).

This period also saw the emergence of new agricultural industries in Niagara. In 1971, the value of processed foods and beverages in Niagara reached \$160 million, reflecting growth in the region's nascent wine industry (Niagara Planning and Development 1977). A few years later, in 1975, the region accounted for 90 per cent of Ontario vineyards and 80 per cent nationwide (Niagara North and Niagara South Federations of Agriculture 1978). This growth was spurred, in part, by local business people who worked to place Niagara wineries on the global stage and encouraged the growth of agritourism in Niagara.

The amount of land used for greenhouses in Niagara also skyrocketed, increasing by 400 per cent between 1951 and 1971 (Niagara Planning and Development 1977). By 1974, over half (56 per cent) of Ontario's flower sales were from Niagara and the percentage of vegetables produced in Niagara greenhouses was also on the rise.

Despite this growth, local farmers were grappling with challenges related to land development and urbanization. Empowered by the popularization of the automobile, and the expansion of the QEW, urban workers were increasingly choosing to live in rural communities and commute to work (Maye 1964; Gayler 1994). The result was suburbanization and sprawl within Niagara, as policymakers worked to accommodate emigrants from nearby Toronto (Maye 1964). Reflecting these growth patterns, the number of residential building permits issued in St. Catharines ballooned from 11,675 in 1970 to 39,022 in 1973. Most of these permits were issued for single family homes (St. Catharines 1974).

The consequences of such development, and the speculative land prices that accompanied it, were felt in the elimination and consolidation of local farms. Between 1951 and 1971, the number of farms in Niagara declined nearly 30 per cent, from 5,548 to 3,950 (Niagara Planning and Development 1977). While this was a slightly more moderate decline than was seen in other Ontario municipalities, the amount of land rented for agricultural purposes in Niagara was also rising. Whereas 10 per cent of agricultural land was rented in 1951, this number had increased to 19 per cent by 1971 (Niagara Planning and Development 1977), reflecting, in part, the increasingly precarious financial position of local farmers.

The need to balance residential development with environmental and agricultural concerns was at least partial inspiration for the creation of a two-tier municipality in Niagara. In the report that formed the basis of the *Act to*

Establish the Regional Municipality of Niagara (1969), Maye (1964) noted the interconnectedness of development in Niagara, and the “pressures upon the land” that called for a coordinated and cohesive response by urban and rural policymakers in the region. The ensuing government response complemented the work of groups like the Niagara Peninsula Conservation Authority, which had been established under the *Conservation Authorities Act* in 1946. A few years after the creation of Niagara Region, in 1976, the Preservation of Agricultural Land Society began advocating for the protection of Niagara farmland, as well.

Despite such efforts, challenges pertaining to urbanization persisted through the 1980s and 1990s. Between 1985 and 1995, the amount of overlap in Niagara between residential development and environmentally sensitive areas (including agricultural land) increased from 2.3 per cent to 6.1 per cent (Carvalho 2017). This encroachment was most pronounced in northern portions of the region, where the QEW served as a key transportation corridor for residents commuting to

work in the Greater Toronto Area (Niagara Region Planning and Development Department 1989). At the same time, rising energy costs and downturns in the global economy made farming more expensive and uncertain. The result was increased pressure on local farmers to sell their land to prospective developers—pressures that continue to be felt today.

The end of the 20th century was nevertheless a period of profound growth in Niagara agriculture. In addition to longstanding strengths in tender fruit farming, the region established a foothold in an emerging greenhouse industry. The efforts of local business people worked to put Niagara’s nascent wine industry on the map, facilitating the growth of agritourism and other forms of value-added agriculture. Agriculture was identified as a key frontier for economic development in Niagara—especially as the region worked to recover from a recession in the 1980s and the decline of traditional manufacturing (Niagara Region 1985).

Photo courtesy Chateau des Charmes Wines



Niagara Agriculture in the 21st century

By the beginning of the 21st century, Niagara's identity as an agricultural and viticultural powerhouse was well-established (Niagara Region 2005). Goods produced in Niagara were being exported across Canada and around the world, while tourists flocked to the region to visit local wineries and markets (Papastavrou and Chandler 2010). The wine industry was bolstered by the provincial government's "Wine and Grape Strategy," first published in 2009 and intended to support industry growth and sustainability. In addition to value-added activities like food and beverage manufacturing, the Region worked to highlight an emerging bioproducts industry in Port Colborne (Niagara Region 2005).

Interest in agribusiness was also driven by the decline of manufacturing in Niagara, and Niagara's broader shift to a post-industrial economy (Sholtens and Papastavrou 2010). The same locational advantages that supported the rise of manufacturing, such as proximity to key transportation corridors and the Canada-US border, made Niagara a prime location for food ingredient manufacturing, bioprocessing, and emerging opportunities in biopharmaceuticals, nutraceuticals, and more (Niagara Region 2013). For rural communities, especially, value-added agriculture and agritourism were increasingly seen as engines of economic growth (Pelham 2011; Pelham 2014). As the region worked to reinvent itself, agriculture thus became a key pillar of economic development policy (Niagara Region 2013).

This period also saw the popularization of a more localized and community-driven agricultural experience. Farmers' markets and u-pick initiatives became increasingly popular, with markets positioning themselves as an important counterbalance to commercial grocers and industry (Hagar 2012). These markets also promised more direct support to local farmers and to Niagara's regional economy (Papastavrou and Chandler 2010). A contemporaneous study by the Niagara Culinary Trail suggested that "if the 435,000 residents of Niagara spent just \$10 of their grocery budget on local food each week, there would be a \$226 million influx into the local economy each year" (Papastavrou and Chandler 2010).

Hoping to seize this potential, groups like the Friends of the Greenbelt Foundation began encouraging more local purchasing. The Region also launched a Local Food Action Plan, overseen by the Region's Agricultural Sub-Committee and Task Force. By 2012, the average farmers'

market customer was spending \$32.06 per visit and making \$18.44 in additional purchases to other area businesses (Hagar 2012). Nearly half (48 per cent) of customers reported visiting the market on a weekly basis, meaning that the average farmers' market consumer was spending about \$128.44 per month at the market (Hagar 2012).

The growing popularity of farmers' markets added an important wrinkle to local agritourism, especially during the summer months. Among tourists visiting Niagara for the wine industry, for instance, 48 per cent reported visiting a farmers' market or country fair (Hagar 2012). Over 20 per cent had picked fruit at a local farm (Hagar 2012). The creation of a Niagara Culinary Trail also encouraged local restaurants to feature dishes prepared with local food, strengthening the links between agriculture and tourism within Niagara (Papastavrou and Chandler 2010). Though we will return to the value of such initiatives below, it is worth noting that many of these specific programs are no longer active.

Nevertheless, the urbanization pressures that emerged in the 1970s continued to be a problem for local farmers. Between 1985 and 2005, the urban landscape in Niagara grew by over 80 per cent (Carvalho 2017). The number of farms in Niagara also continued to fall, though consolidation patterns meant that the average size of a Niagara farm increased over the same period (Niagara Region 2016). Rising operating costs and international competition placed local farmers under strain, while growing land values incentivized the selling-off of Niagara farmland.

In addition to land development pressures, Niagara's agricultural sector also found itself grappling with the threat and uncertainty posed by climate change. In 2011, for instance, an Expert Panel on Climate Change Adaptation (EPCCA) voiced concerns about rising temperatures in the Greater Golden Horseshoe, and the extreme weather events that might accompany climate change in Niagara (Tomalty and Komorowski 2011). The panel argued that rising temperatures could be particularly harmful to crops like the ice wine grapes, which were becoming increasingly central to the local wine industry. The panel also warned that changing temperatures and volatile weather might impact pollinating patterns and flowering, with potentially devastating consequences for Niagara floriculture (Tomalty and Komorowski 2011). Changes to ice cover, groundwater, lake levels, snow cover, water temperature, and soil moisture were also mentioned as cause for concern (Tomalty and Komorowski 2011).



Photo courtesy Chateau des Charmes Wines

Around this same time, many Niagara farmers elected to participate in the Greenbelt Farm Stewardship Program, undergoing voluntary environmental assessments and taking action to protect water sources and reduce greenhouse gas emissions (Papastavrou and Chandler 2010). The Preservation of Agricultural Land Society also advocated for the development of a Niagara Tender Fruit Land Program, which placed restrictions on tender fruit lands to preserve them in 'perpetuity' (Preservation of Agricultural Land Society, n.d.). Though the province implemented such a program in 1994, it had been quickly cancelled a year later.

In response to these land development pressures and environmental concerns, policymakers in Niagara began promoting the idea of 'smart growth,' and the minimization of sprawl through more efficient, dense, and transit-friendly forms of development (Niagara Region 2005). This period also saw the provincial government pass legislation to guide land development in Ontario. This includes the *Greenbelt Act* (2005), which led to the creation of a Greenbelt Plan

and designated nearly two million acres of greenspace as off-limits to residential development (Carter-Whitney 2010; Giverin and Conteh 2021). The province also created the Friends of the Greenbelt Foundation, a not-for-profit group intended to support local farmers and promote environmentally responsible practices. The *Places to Grow Act* (2005) in turn spawned the *Growth Plan for the Greater Golden Horseshoe*, which identified specific density targets and planning priorities for the communities surrounding the Greater Toronto Area (Giverin and Conteh 2021).

Niagara's agricultural sector also began to be impacted by growing automation and an overarching shift in the types of jobs needed on local farms, mirroring similar trends in local manufacturing (Calcott and Conteh 2018). On one hand, the region saw undeniable growth in the types of "knowledge-intensive" industries critical to an innovative and competitive agricultural sector (Conteh 2019). Most of this growth was concentrated in occupations requiring some level of advanced education, such as consulting, operating, and supervisory positions (Conteh 2019).

On the other hand, such trends were mirrored by notable declines in the types of labour-intensive and manual occupations that had supported the rise of Niagara's agricultural sector. Occupations like "General Farm Workers, Nursery" and "Greenhouse Workers, Labourers in Food and Beverage Processing", and "Harvesting Labourers" all began to see declines in terms of employment (Conteh 2019). While Niagara's agricultural sector settled into its newfound strengths in greenhouse production, food and beverage manufacturing, and agritourism, the jobs characterizing these industries were starting to evolve (Conteh 2019). The result was a growing mismatch between the jobs available in agriculture and the region's existing workforce.

In any case, the turn of the millennium saw the agricultural sector become increasingly important to Niagara's regional economy. By 2016, Niagara farms were generating \$838.1 million in total gross farm receipts, contributing \$1.4 billion in GDP, and supporting almost 20,000 jobs (Niagara Region 2016). The region had been established as a powerhouse in grape growing and viticulture, with 82 per cent of all grapes grown in Canada produced by just 100 Ontario farms—the majority of which were in Niagara (Vineland Research and Innovation Centre 2016). Canada's floriculture industry was also growing, and Niagara greenhouses continued to reap the rewards (Vineland Research and Innovation Centre 2016).

Reflecting the importance of agriculture to the region, Niagara Regional Council endorsed a new action plan in 2016. Titled *Growing the Industry: Farm Economy Viability for the Long-Term*, the plan reduced barriers to agricultural development, addressed tax concerns for value-added agriculture, outlined infrastructure gaps, and endorsed the revitalization of Vineland Research and Innovation Centre—an independent, not-for-profit organization focused on horticulture-related research, development and commercialization (Walton 2016). Above all, the plan highlighted the importance of marketing the 'Niagara Brand,' particularly in areas like tender fruit production, floriculture, and the grape and wine industry (Walton 2016).

Niagara's Agricultural Sector Today

Today, the agricultural sector is a critical pillar in Niagara's regional economy. Agritourism, especially, has been identified as an important opportunity for investment and growth (Niagara Region 2022). The Region continues to support the agricultural sector through its Agriculture Policy and Action Committee, which contributes to programs and

strategies intended to advance the interests of local farms (Niagara Region 2022).

These efforts are supported by provincial organizations like the Golden Horseshoe Food and Farming Alliance (GHFFA) and the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA), both of which offer resources, expertise, and support to Niagara farmers (Golden Horseshoe Food and Farming Alliance 2019). In 2019, the federal government also allocated \$134 million to its Food Policy for Canada program, intended to promote Canadian brands, improve food security, and reduce food waste (Government of Canada 2019). Agriculture and Agrifood Canada launched a Wine Sector Support Program in 2022, as well, providing up to \$166 million in funding to improve competitiveness and innovation in the Canadian wine sector (Agriculture and Agri-Food Canada, n.d.).

Within Niagara, several lower-tier municipalities have also recognized the agricultural sector as a priority. In 2018, Niagara-on-the-Lake identified the protection of local agriculture as one of five central pillars to the Town's new strategic plan (Niagara-on-the-Lake 2018). The retention and expansion of agricultural enterprises has also been identified as a core economic development objective in the City of St. Catharines, where 30 per cent of land is designated as agricultural (St. Catharines 2017). For rural communities like the Town of Lincoln, which currently hosts the highest concentration of greenhouses in Niagara, a strong agricultural sector is especially critical (Lincoln 2019).

In turn, the agricultural sector continues to be a bastion of research and innovation within Niagara. Local farmers are pursuing new technologies for seeding, spraying, fertilizing, harvesting, tracking, and more (Lemay et al. 2021). Such technologies are seen as a way of increasing productivity, improving efficiency, and reducing costs (Lemay et al. 2021). The creation of a new state-of-the-art Vineland Growers Co-Operative facility in Lincoln promises to further support innovation in the agriculture sector (Lincoln 2023). The availability of talent from Brock University and Niagara College has been critical to this transition, and the development and retention of highly skilled agricultural workers continues to be a priority (Niagara Region 2022).

Innovation in agriculture has also been supported by several intermediary and research-focused organizations within Niagara. Vineland Research and Innovation Centre remains a world-renowned research centre focused on advancing the horticultural industry in Niagara. Niagara College's Food and Wine Institute; Agriculture and Environmental

Technologies Innovation Centre; and Walker Advanced Manufacturing Innovation Centre provide critical resources and expertise to local agribusiness, as well. At Brock University, the Cool Climate Oenology and Viticulture Institute provides education and outreach services to the grape and wine industry, while researchers at the Niagara Community Observatory have recently been engaged in research and analysis in support of the agriculture sector (Niagara Region 2022). While these are just some of the groups supporting local agribusiness, they reflect a vibrant ecosystem beneath the surface of Niagara's agriculture sector.

At the same time, however, Lemay et al. (2021) find that connections between local farmers and Niagara-based research facilities could be improved. Some farmers remain reluctant to purchase unproven technologies from unproven companies, for instance, and there is often a disconnect between partner organizations and the experiential knowledge of local farmers (Lemay et al. 2021).

The adoption of new agricultural technologies also raises important questions about data management, privacy, and accessibility. To that end, the Region has mentioned

the importance of expanding broadband coverage to rural areas in Niagara, as connectivity becomes increasingly central to the technologies used on local farms (Niagara Region 2022). Nevertheless, the challenges surrounding digitalization run much deeper, and there is room for more coordinated and sustained support. The Region (2022) has mentioned the importance of data to these emerging technologies, for instance, and a proactive approach to data governance could prove beneficial to stakeholders within agriculture and beyond.

It is also important to keep in mind that all these technological changes are likely to have a significant impact on temporary foreign workers in Niagara, and tracking the effect of these changes on Niagara's broader regional economy will be critical.

Innovation in agriculture is not just a technological matter, of course. A recent report by the Standing Senate Committee on Agriculture and Forestry (2019) identifies shifts towards farmers' markets, community-supported agriculture, and alternative proteins as important innovations taking place in Canadian agriculture.

Photo courtesy Niagara Economic Development



There is room, in this regard, to leverage the Niagara region's established strengths in local markets and agritourism (Papastavrou and Chandler 2010). In a similar vein, Conteh (2019) has noted the need for stronger connections between agriculture and other economic sectors like manufacturing, which can help to improve Niagara's performance across other aspects of the agriculture value-chain.

Many familiar challenges remain. Local stakeholders continue to express concern around urbanization and residential sprawl. Since the Second World War, 40 per cent of tender fruit land in Niagara has been lost to urbanization (Carvalho 2017). Richards (2019) similarly notes the "tsunami" of human-dominated land uses that are washing over natural and semi-natural habitats, with detrimental impacts for the pollinator species on which many farmers depend. Sprawl can also create regulatory challenges, as agricultural operations come to exist in greater proximity to residential communities (Niagara Planning and Development Department 1977). While agencies like the Niagara Peninsula Conservation Authority and the Niagara Escarpment Commission provide important protections, their resources are often limited and vulnerable to shifting provincial priorities (Giverin and Conteh 2021).

Land development policy thus continues to be a critical frontier in supporting the agricultural sector. The advocacy efforts of groups like the Niagara Peninsula Conservation Authority and the Preservation of Agricultural Lands Society have been critical in this regard, and the latter continues to advocate for the use of conservation easements, which place restrictions on land development in Niagara. At the same time, Niagara's status as a two-tier municipality can create unique challenges to development policy, and land use remains a contested issue among Niagara municipalities (Giverin and Conteh 2021; Siegel 2019). The growing popularity of Minister's Zoning Orders (MZOs) is also a noteworthy trend and reflects the transition towards a more top-down approach to land development in Ontario (Giverin and Conteh 2019).

In addition to ongoing land development challenges, a recent report by the Climate Risk Institute for the Ontario Ministry of the Environment, Conservation, and Parks also highlights the continued risks associated with climate change in Ontario. Of particular concern for farmers in Niagara is the risk that increasing air temperatures pose to the varieties of grapes used in ice wine production (Climate Risk Institute 2023). Even for non-ice-wine grape varieties, however, extreme heat threatens to change the aroma, size, alcohol content, and sugar concentration of

wine production, with potentially adverse effects on yield, quality, and competitiveness (Climate Risk Institute 2023). Tender fruit production can also be adversely affected by the dry conditions that accompany rising temperatures, while more unpredictable winters can negatively impact greenhouse operations (Climate Risk Institute 2023). These same conditions are having an adverse affect on existing infrastructure, including the irrigation infrastructures on which many Niagara farmers depend (TVO Today 2023).

The picture of who is working in the agricultural sector is also continuing to change. Niagara's workforce is getting older, and growth in younger age cohorts is not keeping pace with the rest of the province (Phillips and Durrant 2017; Niagara Region 2022). These trends are especially pronounced in the agricultural sector, with many farmers poised for retirement in the coming years (Arsenault 2021). This raises important questions about succession, and of the viability of the agricultural sector long-term. Some stakeholders note that the last "crop" for aging farmers is often housing, with rising land values incentivizing retiring farmers to offload land to prospective developers (Arsenault 2021).

Continued automation also means that jobs in Niagara's agricultural sector are different—and in many cases fewer—than what has come before. Table 1 presents a summary of changes in agribusiness jobs between 2001 and 2022, comparing Niagara with provincial (Ontario) and national trends. As the table and graph indicate, Niagara has seen a decline in sector jobs of four per cent over the past two decades, worse than the provincial average decline of three per cent but better than the dismal national average decline of 11 per cent.

Figure 1 indicates that the decline in the sector was far worse in the earlier years of the 21st century, with the decline stabilizing around 2017 and gradually increasing over the past four years. This recent upswing was not large enough to counter the overall depth of decline over the past 20 years, though the sector is projected to continue its upward trend over the next five years.

Table 2 shows percentage growth between 2001 and 2022 in agribusiness jobs by industry. While the overall picture reveals a broad pattern of decline in a relatively large number of agribusiness industries, a few industries point to significant and promising trajectories in knowledge-intensive food manufacturing activities. Industries reporting positive growth over the past two decades are "Other food manufacturing" (107 per cent); "Beverage manufacturing" (95 per cent); "Dairy product manufacturing" (92 per cent); and "Bakeries and tortilla manufacturing" (39 per cent).

Table 1: Change in agribusiness jobs, 2001–2022; Niagara, Ontario and Canada compared

Region	2001 Jobs	2022 Jobs	Change	Percentage change
Niagara	8,742	8,360	(382)	(4%)
Ontario	220,967	214,252	(6,715)	(3%)
Canada	798,786	709,219	(89,567)	(11%)

Figure 1: Industry Job Growth in Agribusiness, 2001–2022; Niagara, Ontario, and Canada Compared

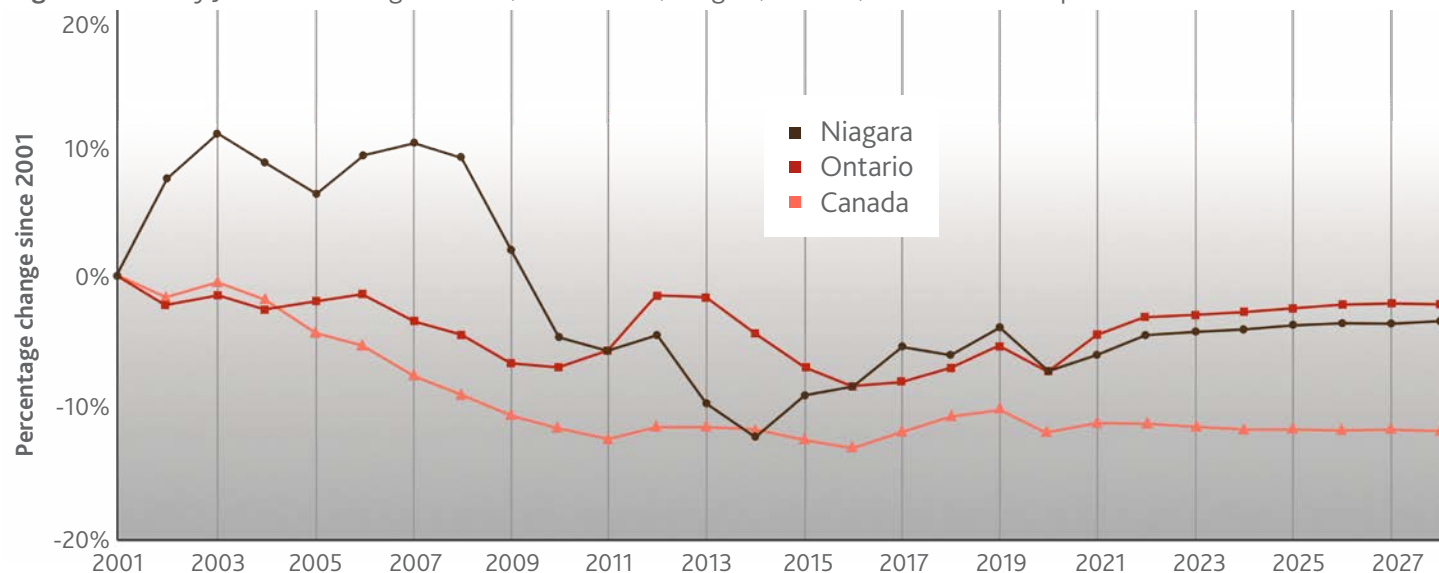


Table 2: Percentage change in agribusiness jobs by industry, 2001–2022; Niagara, Ontario, and Canada compared

Industries	St. Catharines —Niagara	Ontario	Canada
Other food manufacturing	107%	52%	81%
Beverage manufacturing	95%	66%	69%
Dairy product manufacturing	92%	43%	32%
Bakeries and tortilla manufacturing	39%	34%	14%
Hunting and trapping	0%	18%	(11%)
Farms	(4%)	(24%)	(24%)
Grain and oilseed milling	(23%)	(26%)	(1%)
Support activities for farms	(37%)	(35%)	(15%)
Agricultural supplies merchant wholesalers	(38%)	8%	10%
Farm product merchant wholesalers	(52%)	15%	14%
Meat product manufacturing	(56%)	32%	6%
Sugar and confectionery product manufacturing	(83%)	(31%)	(6%)
Animal food manufacturing	(84%)	14%	(5%)
Fruit and vegetable preserving and specialty food manufacturing	(89%)	(48%)	(11%)

These trends could indicate innovative, research-intensive, and value-added activities in these areas of the region's agribusiness sector—activities consistent with indicators of higher-than-average innovation, resilience, and adaptability. These manufacturing activities are also indicative of computer-enabled food production systems, suggesting that Niagara is growing in industries with large amounts of automation and technologization. As mentioned above, this growth has not necessarily offset the job declines seen in other portions of the agricultural sector.

Finally, the rise of agritourism is creating unique regulatory challenges for agribusiness in Niagara. Many of the same policies meant to protect the viability of Niagara agriculture also present obstacles to tourism growth. The use of designated agricultural land is tightly regulated, for example, meaning that only small percentages of that land can be allocated to non-agricultural use. As farmers look to expand into retail and accommodation offerings, the question of how much commercial use can be added to a property before it infringes on its agricultural status can be difficult to navigate. At the same time, farmers themselves are learning to engage in farmgate sales, crop processing, and other value-added activities (Gayler 2003).

In a similar vein, wineries are facing challenges related to provincial tax policy. Ontario wines sold at on-site winery stores are required to pay an additional "sin tax," while other restrictions make it difficult for wineries to sell directly to local businesses (Slobodian 2023). As a result, there is little incentive for local restaurants and tourist hubs to prioritize Niagara wines on their menu (Slobodian 2023). A recent motion passed by Niagara Regional Council aims to put pressure on the province to remove the tax. Together, these regulatory challenges display multilevel governance issues that characterize the agricultural sector in Niagara, and the ongoing exchange between local and provincial policy.

Conclusion

The agricultural sector remains a cornerstone in Niagara's regional economy. The sector has grown significantly since the incorporation of Niagara Region in 1969, and local farmers continue to be trendsetters. Many are investing in new technologies, and pursuing opportunities in agritourism and value-added agriculture.

At the same time, Niagara's agricultural sector faces familiar challenges. Urban sprawl is pushing residential and industrial development into Niagara farmland,

driving up land values and incentivizing the sell-off of agricultural land. Climate change is also creating uncertainty for local farmers, and monitoring the impact of rising temperatures and volatile weather patterns will be critical moving forward, especially in a region with a micro-climate such as Niagara's.

More generally, Niagara's agricultural sector is undergoing structural change. As local farmers invest in new technologies, greater levels of automation are changing the types of jobs required on contemporary farms. The attraction, development, and retention of highly skilled workers will be an important part of meeting these changing needs, while the support of Niagara's existing agricultural workforce is also a priority.

To that end, future research should dive deeper into the specific levers available to local policymakers in support of the agricultural sector. In some cases, these policy levers will be direct—like the use of local procurement and purchasing to support Niagara's food system. In others, the impact of public policy on local agriculture may be more tertiary – such as policies that facilitate denser development and reduce reliance on urban sprawl. Others have suggested a need for a more coordinated and cohesive approach to agricultural development among local stakeholders, and for strengthening ties between the many institutions, researchers, and businesses at work in the agricultural sector (Lemay et al. 2021). A proactive approach to agricultural policy can help to maximize existing strengths, coordinate ongoing change, and keep Niagara agribusiness competitive on the global stage.

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