Growing in Crisis: Resilience Within the Canadian Food System

Trinity College Sustainable Food Systems ROP

TRN299Y

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1. Introduction

During the summer of 2020, I participated in the TRN299Y Sustainable Food Systems Research Opportunity Program. This Research Opportunity Program (ROP) was operated under the supervision of Professor Michael Kessler, with the objective of expanding existing urban agriculture initiatives at Trinity College and contributing to the Trinity College Sustainable Food Systems Research Group. Through this ROP, I also became a junior researcher for Feeding the City: Pandemic & Beyond, a Toronto-based research project documenting food system change in light of the COVID-19 pandemic. This paper will provide a detailed report of my work from TRN299Y, which focused on the urban and rural food networks that adapted to the COVID-19 pandemic. In doing so, this paper will discuss the ways in which food networks across Canada have adapted to COVID-19 and successfully maintained resilience, thereby committing the findings of my work to the institutional knowledge of both the Trinity College Sustainable Food Systems Research Group and Feeding the City: Pandemic & Beyond. Building upon my work from TRN299Y and lessons learned from the COVID-19 pandemic, this report will answer the following question:

1) What transformations must be made within the Canadian food system to increase resilience in times of crisis?

Literature Review

The concept of resilience is most generally described as the ability to adapt to the circumstances of a crisis, and to recover from any challenges induced from said circumstances (Pingali, P., Alinovi, L., & Sutton, J., 2005). However, the definition of resilience is dependent on context, including within the context of the food system. A 2005 study of food security and

related fragility within the food system determines that food system resilience refers to the capacity of a food system to respond to disruptions generated during a period of crisis, including natural disasters or epidemic diseases, and to recover food security in subsequent periods of stability (Pingali, P., Alinovi, L., & Sutton, J., 2005). While this definition has been widely accepted among scholars, it has been expanded within the past several years to address the need for enduring resilience within the food system. A 2015 conceptual analysis of food system resilience, for example, elaborates on the concept by situating resilience within all levels of the food system (Tendall, Joerin, Kopainsky, Edwards, Shreck, Le, Kruetli, Grant, & Six, 2015). This study explains that food system resilience is dependent on the capacity of the food system, on both a national and regional level, to withstand disturbances generated from emergency situations, and to adapt to said disturbances in a way that preserves and enhances the long-term functionality of the system (Tendall, Joerin, Kopainsky, Edwards, Shreck, Le, Kruetli, Grant, & Six, 2015). Furthermore, it is explained that food system resilience requires a cycle of learning, in that previous emergencies should be reflected upon in order to initiate change within the food system, so as to improve functionality and adaptability during future emergencies (Tendall, Joerin, Kopainsky, Edwards, Shreck, Le, Kruetli, Grant, & Six, 2015).

Building off the concept of resilience, there is general consensus among scholars that the Canadian food system is far from resilient. A 2015 study of the Canadian food system finds that Canadian food networks, which rely upon highly concentrated systems of food production and distribution, are increasingly vulnerable and non-resilient (Rotz, & Fraser, 2015). This study also determines that agricultural industrialization in Canada has led to a notable decline in market diversity, thereby contributing to a reduction in resilience. This loss of diversity within the Canadian agricultural sector largely impacts small- and medium-scale farmers, who are

economically marginalized within commercial markets, thus making adaptation to crisis extremely difficult (Rotz, & Fraser, 2015). The implications of agricultural industrialization are further explored in a 2016 study of collaborative food networks in Canada (Blay-Palmer, Sonnino, & Custot, 2016). This study determines that the Canadian food system, which operates on a global scale and incapacitates small-scale farms from operating on a place-based, ecological level, is volatile and ultimately incapable of maintaining resilience (Blay-Palmer, Sonnino, & Custot, 2016). This inability to maintain resilience within the Canadian food system has been confirmed in light of the COVID-19 pandemic. In their post-pandemic policy plan, Food Secure Canada (2020) details the structural insufficiencies of Canada's food system, as magnified by COVID-19, including unreasonably long supply chains, overreliance on global imports and high-input farming, and social protection programs that perpetuate food insecurity (Food Secure Canada, 2020).

There is also general consensus among scholars that as the climate crisis worsens, the likelihood of weather-related disaster will intensify. A 2005 investigation of international climate mitigation goals reveals that in the coming decades, the frequency and intensity of climate-related disasters will largely increase unless world leaders commit to emission reduction strategies and implement mechanisms for sustainable development (Yamin, Rahman, & Huq, 2005). In the ten years following this 2005 investigation, climate mitigation targets were continually postponed, and weather-related crises induced by anthropogenic climate change increased and intensified worldwide. A 2015 analysis of the seemingly irreversible nature of climate change emphasizes the need for immediate action to reduce global emissions, so as to decrease the likelihood and severity of future climactic disasters (Shue, 2015). Similarly, Kelman, Gaillard, and Mercer (2015) reiterate the potential for global and regional disaster

within the context of climate change, which is further perpetuated by various societal inequities. They warn, for example, that the impacts of climate-related ecological disasters including floods and wildfires are exacerbated by the social injustices experienced by vulnerable populations. They also emphasize that these inequities are present within the food system and contribute significantly to climate change (Kelman, Gaillard, & Mercer, 2015). Furthermore, a 2015 analysis of the link between climate change and disaster scenarios determines that the losses incurred from climactic disasters are increasing, thereby contributing to planetary vulnerability and increasing likelihood of future disaster (Mechler, & Bouwer, 2015).

Understanding that the Canadian food system is vulnerable, and that future disaster is inevitable, it is paramount that the agricultural sector engages in practices that not only mitigate the impacts of climate change, but also actively contribute to food system resilience. Through the agricultural sector's adaptation to the COVID-19 pandemic, the actions that must be undertaken within the food system to ensure future resilience have become increasingly apparent. In the following sections of this paper, various actions that hold great potential to contribute to the creation of a resilient food future in Canada will be discussed within the context of my work from the summer ROP. These actions have been separated into the following categories: resilient farming practices, government supports, and social advocacy.

3. Resilient Farming Practices

As it currently stands, the Canadian food system is not adequately equipped to absorb and adapt to disaster related shocks. Whether faced with a climate change-induced extreme weather event, or a viral pandemic such as COVID-19, Canada's food system lacks resilience. Throughout the duration of my ROP, I have come to several conclusions regarding specific

farming practices that have great potential to increase resilience within the Canadian food system, including the development of stress resistant plants and the widespread implementation of ecological farming practices.

3.1. Stress Resistant Plants

It is undeniable that the climate crisis represents a major challenge in the agricultural sector. As global warming accelerates, extreme weather events are becoming increasingly unpredictable and are threatening crop production across the country. In addition to the acceleration of the climate crisis, global population is set to increase exponentially within the coming decades, consequently increasing demand for agricultural products (Folberth, Khabarov, Balkovič, Skalsky, Visconti, Ciais, Janssens, Peñuelas, & Obersteiner, 2020). It is largely suggested that farmers' efforts to tackle both the climate crisis and widespread population growth will require both cropland expansion and intensification to meet increased demand for agricultural products. However, expanding existing cropland and intensifying farming practices will further exacerbate the climate crisis and fail to address the need for long-term sustainability within the food system (Folberth, Khabarov, Balkovič, Skalsky, Visconti, Ciais, Janssens, Peñuelas, & Obersteiner, 2020).

In the beginning weeks of my ROP, I was tasked with creating a presentation pertaining to urban agriculture. This presentation, based on the findings of Zhang, Li, and Zhu (2018), revealed the potential of naturally stress resistant crops for growing in crisis. Naturally stress resistant plants (NSRPs), are plants that have evolved to grow in extreme environments and that hold the ability to sustain themselves in otherwise inhospitable environmental conditions (Zhang, Li, & Zhu, 2018). As the climate crisis worsens, abiotic stressors such as drought, conditions of

high soil salinity, and extreme temperatures will increase in severity and frequency, thereby impacting crop productivity; however, NSRPs like millet and quinoa are naturally capable of sustaining these stressors, which indicates their potential for growing in climactic crisis. NSRPs also hold great potential to decrease agricultural inputs. Over the years, agricultural inputs, including water, pesticides, and chemical fertilizers, have increasingly been used to compensate for low levels of stress resistance in major crops like soybean, corn, and wheat (Zhang, Li, & Zhu, 2018). The introduction of NSRPs to Canadian food production would largely decrease the need for agricultural inputs, as the management of these plants requires significantly less water, fertilizers, and pesticides, thus contributing to a sustainable agriculture (Zhang, Li, & Zhu, 2018). In addition to their ability to withstand extreme abiotic conditions and to contribute to a sustainable agriculture, NSRPs such as millet and quinoa are beneficial to human health, as they are highly nutritious and diversify the human diet (Zhang, Li, & Zhu, 2018).

Currently, NSRPs such as millet and quinoa are not commonly grown within the Canadian food system. However, despite the absence of NSRPs from Canada's present growing operations, it remains true that the Canadian agricultural sector is exposed to abiotic stressors that threaten crop productivity and result in major losses. Among the stressors present within the Canadian agricultural sector, drought is the most detrimental, as exemplified by a 2017 case study from Saskatchewan. Over the last two centuries, upwards of 40 droughts have occurred in the western Canadian provinces, many of which endured for multiple years (Agriculture and Agri-Food Canada, 2018). In 2017, Saskatchewan experienced a record-breaking drought and wildfire season that damaged agricultural infrastructure and reduced production yields at an unprecedented rate in the province. The environmental impacts of the drought were extensive, including increased soil erosion and salinization, depleted soil moisture, increased incidence of

pests, and consequent reduction of crop yields (Agriculture and Agri-Food Canada, 2018). In addition to the environmental degradation and production loss induced by the drought, the economic cost totalled several billions of dollars (Agriculture and Agri-Food Canada, 2018).

Noting the impact of abiotic stressors on the Canadian food system, as exemplified by a case study of the 2017 drought in Saskatchewan, it is becoming increasingly apparent that stress resistance is lacking in current Canadian crop production. However, NSRPs could present a unique opportunity to increase crop resilience and avoid losses such as those incurred by the aforementioned drought in Saskatchewan. By promoting the cultivation of NSRPs, specifically those that thrive in the drought-induced conditions outlined above, including cereals like millet and quinoa, the Canadian agricultural sector could increase resilience on a production level. Stress resistant plants are inherently capable of withstanding the conditions induced by extreme climate events, such as the soil salinization and moisture depletion seen in Saskatchewan, thus enabling them to contribute to crop resilience. While the cultivation of NSRPs within the Canadian agricultural sector is not a permanent solution for the lack of resilience to abiotic stressors in Canada, it holds great potential as a starting point for increasing crop resilience on the level of crop production.

3.2. Ecological Farming Methods

In the past several decades, the Canadian agricultural sector has seen the rise of agribusiness corporations, and a consequent overreliance on conventional farming practices. These agribusiness corporations are largely responsible for supplying the agricultural inputs used by Canadian farmers, such as fertilizers, chemical pesticides and insecticides, and machinery (National Farmers Union, 2019). These corporations have adopted an agricultural model that

maximizes the use of these agricultural inputs, in an effort to increase agricultural production and maximize crop yields. As a result, the application of nitrogen fertilizer on Canadian farms has tripled since 1980, and the use of pesticides has tripled since 1990. These figures indicate an overreliance on conventional agricultural inputs and practices (National Farmers Union, 2019).

This high-input model of agriculture, which has increased overreliance on conventional farming practices, has massively damaged Canadian ecosystems and threatened conservation efforts across the country, thereby increasing the likelihood of climate related disasters and reducing resilience within the food system (National Farmers Union, 2019). However, the adoption of ecological farming practices would provide an opportunity for resilience to further develop within the Canadian food system. Ecological farming practices are generally considered to be methods of agricultural production and management that contribute to sustainability within the agricultural sector. According to the Ecological Farmers Association of Ontario (2020), ecological agriculture entails "regenerative, organic, and other holistic practices" that actively improve soil health and maintain ecosystem biodiversity. Ecological farming practices are also considered to be socially engaged, in that they support regional ecosystems and emphasize farmer-to-farmer knowledge transfer (Ecological Farmers Association of Ontario, 2020). Furthermore, ecological farming practices contribute to climate resilience as they reduce the need for chemical inputs, including pesticides and insecticides, thereby supporting soil fertility, mitigating greenhouse gas emissions, and ultimately reducing the risk of weather-related disaster (Robertson, Gross, Hamilton, Landis, Schmidt, Snapp, & Swinton, 2014).

Across the country, numerous small- and medium-scale farms are operating with ecological farming practices. Many of these farms have continued to operate successfully during the COVID-19 pandemic. As part of my work with Feeding the City, I analyzed the growing

practices of several small-scale, ecologically oriented farms across southern Ontario, which have maintained operations during the pandemic. Firstly, Zephyr Organics Farm, located in Zephyr, Ontario, has had increasingly prosperous growing seasons using ecological farming practices. Among other practices, this farm has implemented crop rotation, which involves varying crop selection in a certain area of land from season to season. This has been extremely successful in increasing resilience at Zephyr Organics, as it has contributed to maintaining soil health, curtailing disease, and warding off pests (Zephyr Organics Farm, 2020). Companion planting has also contributed to agricultural resilience at Zephyr Organics, as this method of growing reduces the use of pesticides and minimizes risk of crop failure (Zephyr Organics Farm, 2020). Similarly, at Joyfully Organic Farm in Markham, Ontario, ecological methods of farming such as multi-succession planting and intensive spacing have contributed to resilience. Joyfully Organic has expressed that these methods not only maximize production yields, but they also deter weeds and prevent soil erosion (Joyfully Organic Farm, 2020).

The continued operation of farms such as Zephyr Organics and Joyfully Organic Farm during the COVID-19 pandemic has contributed to resilience within the Canadian food system. As previously discussed, food system resilience is defined as a food system's capacity to absorb disturbances generated by a crisis. While it is necessary for a food system to maintain resilience on a national level, it is also essential that smaller regional food webs maintain resilience in times of crisis. By definition, both Zephyr Organics and Joyfully Organic Farm have contributed to resilience within the Canadian food system, as they have been capable of absorbing the disturbances inflicted upon the food system by the COVID-19 pandemic, which include market volatility and bottlenecked distribution. Additionally, the ecological farming practices utilized by Zephyr Organics and Joyfully Organic Farm further contribute to food system resilience, as they

actively reduce greenhouse gas emissions and consequently decrease the likelihood of future weather-related crises.

4. Government Support

In times of crisis, rural and urban food networks require external assistance to maintain resilience. The COVID-19 pandemic has highlighted the need for government support programs that not only support rural and urban food networks, but that protect producers from market volatility and environmental instability. Since the outbreak of COVID-19, the structural insufficiencies of Canada's food system have been amplified. Among said insufficiencies are an overreliance on global imports, which have replaced and disincentivized locally grown foods in Canada. Additional insufficiencies include unreasonably long supply chains, which are predominately owned and operated by multinational corporations across long distances, which neglect small- and medium-scale farms (Food Secure Canada, 2020). However, as these vulnerabilities wreak havoc on rural and urban food networks alike, farmers across the country have been left unsupported by the federal and provincial governments. Through my work with Feeding the City, I analyzed the programs and policies implemented by the Canadian government to support farmers during the COVID-19 pandemic and was able to draw several conclusions regarding the potential of government support programs to support farmers in crisis.

4.1. Business Risk Management Programs

The Canadian agricultural sector is supported by the Government of Canada through the Department of Agriculture and Agri-Food Canada (AAFC). Over the past several decades, AAFC has implemented several business risk management programs to help producers offset

income and production losses incurred from a disaster. Among these programs are AgriRecovery, AgriInvest, AgriInsurance, and most notably, AgriStability. The AgriStability program is a margin-based program that protects Canadian producers from experiencing large margin declines in farm income (Agriculture and Agri-Food Canada, 2020). Program participants are eligible to receive AgriStability payments if their farm's production margin falls below 70% of their reference margin for the program year. As part of my work with Feeding the City, I conducted a thorough analysis of the business risk management programs that provide support to farmers and agricultural producers in moments of high risk, which I have summarized below.

Since their initial release, Canadian business risk management programs have been thoroughly criticized as being ineffective and harmful, rather than supportive. It has been suggested that programs like AgriStability do not reduce risk on farms, but that business risk management programs actually increase business and financial risk (Uzea, Poon, Sparling, & Weersink, 2014). Payments from these programs create a false sense of security among farmers, thus making them much more likely to assume additional financial risk, increase debt, and decrease resilience (Uzea, Poon, Sparling, & Weersink, 2014). Canadian business risk management programs like AgriStability have also been criticized for disincentivizing diversity on farms, as they favour a commodity-specific approach, thereby making support payments increasingly inaccessible and reducing resilience on biologically diverse farms (Ker, Barnett, Jacques, & Tolhurst, 2017).

It has also been suggested that current business risk management programs like AgriStability are often accompanied by negative environmental impacts. In an effort to maximize production, agricultural stabilization programs often suggest that the application of

products such as nitrogen fertilizer, for example, can reduce risk and maximize yields (Eagle, Rude, & Boxall, 2016). However, it remains true that the increased use of chemical inputs like nitrogen fertilizer are actually risk-enhancing, as they increase greenhouse gas emissions, thereby contributing to climate change and increasing the likelihood of environmental disaster. These effects further render business risk management programs ineffective (Eagle, Rude, & Boxall, 2016). The AgriStability program has been extensively critiqued by farmers and farmers' organizations during the COVID-19 pandemic, who claim that a convoluted application process and increased wait times are the reason for low program enrolment. Furthermore, the lengthy application process makes Canadian business risk management programs increasingly inaccessible to small-scale family farms, which often lack the logistical capabilities of large, corporate run farms.

4.2. Agricultural Investments

Noting the shortcomings of current business risk management programs like AgriStability, which have been apparent both before and during the COVID-19 pandemic, it is relatively simple to determine the features that future agricultural support systems must have in order to maintain resilience on farms. First and foremost, any future support programs implemented within the agricultural sector should not only reduce-risk on farms, but also incentivize ecological farming practices. In order to meet these criteria, the National Farmers Union has emphasized the need for long-term investments in the agriculture and agri-food sector (National Farmers Union, 2020). It is believed that public investments in farming would largely contribute to stable farm operations and create a stronger, more resilient food system, thereby reducing the need for emergency program payments in future crises. Likewise, Food Secure

Canada (2020) has made similar recommendations for post-pandemic investments in the agricultural sector. In order to create a resilient food system, federal, provincial, and territorial governments must invest in local and regional food webs, including small- and medium-scale farms, food processing facilities, and distribution centres (Food Secure Canada).

5. Social Advocacy

While the COVID-19 pandemic has proven the importance of resilient growing practices and efficient government support programs in the Canadian food system, it has also emphasized the need for social advocacy. It remains true that in times of crisis, the most marginalized people in society are disproportionately exposed to the impacts of disaster. The same is true within the context of the food system, as the most marginalized people in Canadian society experience food injustice at a disproportionate rate. For a food system to be truly resilient in times of crisis, it should actively reduce the disproportionality associated with the disturbances induced by a crisis. In order to protect Canadians from the impacts of disaster within the food system, it is imperative that we advocate for fundamental change within the food system, specifically with regard to Indigenous food sovereignty.

5.1. Indigenous Food Sovereignty

The concept of food sovereignty is generally understood as a person or nation's inherent right to control their respective food systems, from production to distribution. A food sovereignty framework involves numerous goals, which vary from place to place, but most often include increasing access to healthy and culturally significant foods, incorporating environmentally sustainable methods of production, and strengthening local economies

(Desmarais, & Wittman, 2014). Those pursuing food sovereignty are seeking fundamental social change within the food system, including those seeking Indigenous food sovereignty. Indigenous food sovereignty is widely defined as the present-day strategies that allow Indigenous peoples to sustain their traditional methods of food production, including hunting, fishing, and gathering, and to reclaim their traditional territories (Desmarais, & Wittman, 2014). Furthermore, Indigenous food sovereignty advocates against the privatization of food, as within this system, food is sacred and intrinsic to Indigenous identity, rather than a tradeable commodity (Desmarais, & Wittman, 2014).

Through my ROP, I have observed the ways in which the COVID-19 pandemic has exemplified the need for Indigenous food sovereignty in Canada. For centuries, colonialism, imperialism, genocide, and consequent disruption of the intergenerational transfer of knowledge have deprived Indigenous peoples of their traditional forms of sustenance. The current Canadian food system perpetuates these inequalities through the destruction of sacred Indigenous lands and the marginalization of Indigenous women, thus further undermining Indigenous food sovereignty (Food Secure Canada, 2020). In light of the COVID-19 pandemic, food insecurity has been exacerbated within Indigenous households and communities, consequently reducing connection to land and culture, and leading to further challenges in obtaining food sovereignty (Food Secure Canada, 2020). Food insecurity exists when an individual or group does not have physical or economic access to safe and nutritious foods. Additionally, among Indigenous communities, food insecurity includes the inability to access culturally significant foods (The Nuluaq Project, 2016). When culturally significant foods become inaccessible in Indigenous communities, Indigenous peoples are often forced to replace traditional foods with industrially produced

market foods, thereby diminishing self-reliance on land and culture for sustenance (Gerlach, & Loring, 2013).

In order to ensure the long-term resilience and self-determination of Indigenous communities, it is paramount that agricultural policies are implemented that preserve sacred Indigenous lands, support place-based food networks, and invest in adequate infrastructure. In their post-pandemic policy plan, Food Secure Canada (2020) provides numerous policy recommendations to support Indigenous food sovereignty in Canada. It should be emphasized that prioritizing self-determination for Indigenous peoples and communities will require distinct approaches, so as to ensure that the needs of distinct First Nations, Inuit, and Métis groups are addressed (Food Secure Canada, 2020). Firstly, treaties and traditional land rights must be upheld to ensure that Indigenous peoples obtain control over lands and waterways (Food Secure Canada, 2020). Next, investments must be made in all Indigenous communities, both rural and urban, to ensure that clean drinking water and safe housing is accessible to all (Food Secure Canada, 2020). Furthermore, monetary support must be granted to any and all Indigenous-led groups that are serving Indigenous food systems and fostering Indigenous food sovereignty (Food Secure Canada, 2020). Additionally, Indigenous communities must be supported in designing and implementing various Indigenous food ways, including community kitchens, gardening programs, greenhouses, and hunter support programs and camps (Food Secure Canada, 2020).

6. Implications for Trinity College

In the fulfillment of my ROP, the majority of my work focused on rural and urban food networks in Canada in their adaptation to the COVID-19 pandemic, and the government

programs that were meant to support them in said adaptation. However, the insight I have gained regarding methods to increase resilience within the Canadian food system hold great potential to be applied to the existing and future urban agriculture initiatives at Trinity College.

It should be noted that the gardens at Trinity College, including the raised beds in the backyard of St. Hilda's and the Munk North rooftop garden, already employ several of the ecological farming methods discussed in Section 3.2. Among said methods are companion planting, which has great potential to improve the success of growing projects at Trinity College. It should be further emphasized that the decreased use of agricultural inputs, including fertilizers and insecticides, would enable Trinity College to decrease greenhouse gas emissions from various urban agriculture initiatives. As a result, the College's contribution to climate change would be reduced, thus helping to decrease the likelihood of extreme weather events and foster resilience within Toronto's urban food network.

It should also be noted that the urban agriculture initiatives at Trinity College could largely benefit from the implementation of naturally stress-resistant plants. As discussed in Section 3.1. of this report, naturally stress-resistant plants are able to withstand extreme conditions that are otherwise inhabitable to other plants. This remains true for both rural and urban areas, including Toronto, where abiotic stressors include extreme seasonal temperatures, conditions of high soil salinity caused by the use of road salt, and various air and water pollutants. Understanding the resilience of stress-resistant crops, it is possible that these plants could thrive in Toronto. In addition to being able to thrive in Toronto despite abiotic stressors, these plants could also contribute to student health and well-being at Trinity College, as they would increase nutrition intake and diversify the diet of students, staff, and faculty at the College. While the growing requirements for stress resistant crops, including cereals like millet

or quinoa, may differ from those of the current produce grown at Trinity, it may be worth expanding growing operations to include these resilient plants in the future.

7. Conclusion

The COVID-19 pandemic inflicted entirely unprecedented shocks upon urban and rural food networks nationwide and proved that the Canadian food system lacks resilience. While future crises are inevitable, whether induced by anthropogenic climate change or a viral pandemic like COVID-19, the Canadian food system should not have to perish when faced with a disaster situation. My work with the Trinity College Sustainable Food Systems Research Group and Feeding the City: Pandemic & Beyond during this summer ROP has demonstrated that resilience is possible within the Canadian food system. In order to survive future crises, the Canadian food system must be transformed to prioritize ecological growing practices that enhance planetary health and mitigate the impacts of climate change. Moreover, the Canadian federal, provincial, and territorial governments must invest in local and regional food webs in order to decrease business and financial risk associated with disaster. Adaptation to future disaster must also include advancing social equities within the food system, increasing food access, and championing food sovereignty.

Building off the findings of my ROP, implications for further research include, but are not limited, to the following. Firstly, future urban agriculture initiatives at Trinity College should explore the potential for growing stress-resistant plants that can sustain the abiotic stressors present in Toronto, including extreme seasonal temperatures, high levels of soil salinity, and various types of pollution. Secondly, future research projects should envision the development of an ecological growing system through the urban agriculture initiatives at Trinity College. Finally,

the existing and future urban agriculture projects at Trinity College should uplift Indigenous voices in Toronto, as well as incorporate traditional growing methods and culturally significant foods in partnership with Indigenous students and groups at the University of Toronto.

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