Political Affairs

School Gardens

August 15, 2023

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Abstract

Social assistance has proven to be insufficient for low-income families to meet all their basic needs, and COVID-19 has further impacted the ability for households to be well fed and healthy. The federal and provincial governments have promised increased funding for agricultural sectors in hopes to increase food security infrastructure. However, large-scale farm operations require an extraordinary use of natural resources, thus questioning the sustainability of industrial agriculture in meeting food security demands at a local level. Thereby exemplifying why alternative policy strategies must be explored due to the problem of affordability amplified by COVID-19, as well as the sustainability of agriculture activities in the era of climate awareness. This article argues the potential of a provincial *school gardens* policy which support cities using urban agriculture within public K-12 school properties to decrease the incurrence of household food insecurity, while also simultaneously adapting to educating youth on their role as stewards to the environment. Furthermore, urban agriculture has the potential to effectively restore farmland lost from urban sprawl by creating gardens that act as a social security net for individuals suffering from food insecurity. Food banks have seen a significant increase in demand for their services in the last decade due to the heightened cost of living. Thus, by having a source of food production that is specifically created as another form of social security, relieves the pressure food banks endure by providing food directly to communities suffering from food insecurities. A variety of programs exist in local cells across Canada that can be used as inspiration for the Government of Ontario to implement a provincial school gardens policy program, however due to the diversity of school layouts, the challenges of implementing gardens at different scales will be discussed.

Introduction

Urban agriculture was once understood as the watering of gardens and lawns. Today, it has evolved into the activity of growing and harvesting food in cities, which has been gaining popularity in developed countries including North America. Benefits stemming from urban agriculture highlights the promotion of a healthy lifestyle and plant-based diets, and improvements in mental health and physical activity. In addition, urban agriculture is becoming recognized as a critical component in developing sustainable cities, due to: its ability to reduce storm water run-off, heat island effects, and the creation of habitats and aesthetic value (Marshman 2015). Although home gardening can be considered a pleasant alternative to having to pay for food, how can incorporating more spaces to grow fruit and vegetables in Canadian cities play a role in reducing food insecurity?

Food security is recognized as a human right, and achieved when a community has access to safe, nutritious, and culturally appropriate food (United Nations 2015). COVID-19 fundamentally threatened food security in Canada by creating an income shock to consumers, as well as challenge the capacity of Canada's food supply chain. Areas that were dependent on office worker traffic or tourism, increased food bank usage by almost 600% following the first lockdown in March 2020 (Food Banks Canada 2020). This increase in pressure from food banks was compounded by a drop of volunteer labor, and disruptions to donations and local food supply chains. Government responses by increasing funding for support was crucial in the ability for food banks to continue supporting their community. Nonetheless, anxiety around what will happen next when these supports diminish remains high. Prior to the pandemic, food insecurity was at an all-time high in Canada, with 4.4 million Canadians identifying as being food insecure (See Graph 1.4). Moving forward from the pandemic, food prices are expected to rise by 5%, challenging the sustainability of continued farming subsidies (Canada Food Price Report 2021). Advocacy groups are calling on the federal government to invest heavily in the agriculture industry to reinforce the food supply chain and prevent any further disruptions which could cause an increase in food insecurity and economic destress. However, considering the looming impacts of climate change and the impact industrial agriculture has on natural resources, Canada need to consider locally empowering solutions to food security in their cities.

Due to urban agriculture's benefits to the environment, Canadian provinces should seek to incorporate urban agriculture into their education curriculums to create spaces where cities have a network of locally produced, nutritious food. The United Nations Food and Agriculture Organization calls for the conservation of natural resources and the adoption of improved methods of agriculture production. While traditionally, the government of Canada addresses food insecurity with investments in agriculture, it is evident these investments are no longer resulting in effective growth. The degradation of natural resources, loss of biodiversity, and spread of transboundary diseases (UNFAO 2017) all contribute to the

depreciation of crop growth. This reality is challenging the realization of the United Nations sustainable development goals of zero hunger, good health, and well-being by 2030(UNDESA 2015) .

In this article, I explore the potential school gardens have in supplementing the food supply for the most vulnerable, and simultaneously acting as a climate initiative due to its compatibility with the concept of sustainable cities. School gardens have a long history of being used for achieving biophysical needs and sociopolitical needs (Ralston 2011). Some cities in Canada, such as Montreal (QC), Toronto (ON), Vancouver (BC), and River Valley (NS) have demonstrated urban agriculture's capacity to improve food security in a locally empowering way.

Theory

Dubbeling claims that to meet the challenges faced by the urban poor resulting from climate change approaches that are multi-stakeholder involved, decentralized, and flexible in optimizing the use of locally available resources need to be adopted to solve social issues (Dubbeling, 2011). The spike in demand for food banks as a result of the COVID-19 pandemic resulted in massive short-term support from the federal and provincial government. Individuals are still struggling to recover from the loss of employment, and as such the demand for food banks are still at an all-time high. With the support from the government expected to dwindle drastically, food banks continue to be challenged to fill their cupboards. Prior to the pandemic food banks rely heavily on donations from their communities, however many communities continue to struggle with food insecurity as a result from the impacts of the pandemic. Thus, investing in school gardens as a form of urban resiliency that protects communities from unforeseen events will return them faster to a pre-event state. Their potential benefits have further reaching components into issues such as climate change and health. Climate change is expected to compound the frequency and consequences of events like COVID-19 and other environmental challenges that could critically hamper the province's food supply chain. Establishing a network of school gardens in cities through provincial policy will do more to improve food security instead of school's only serving marginalized communities choosing to install them on their own agenda.

Methodology

In building this article, climate change was first acknowledged as a significant threat to human activity. The impacts of agriculture on the environment were explored to understand industrial agriculture's contribution to environmental degradation. As such, the government's response of investments to agriculture to rising food insecurity is critiqued as unsustainable in the long run and potentially catastrophic, as it increases the status quo activity that's eroding ecosystems. Empirical data was gathered to measure the severity of food security in Canada and their trends in the last 15 years to determine if current school garden programs in Canada had any impact on the occurrence of food insecurity.

Literature Review

Food Security in Ontario

The Government of Ontario has categorized food security under mandates concerning climate change, income inequality, and organic wastes. In Ottawa, where 14% of households are food insecure, Food banks have seen a 15-30% increase in usage in the last 5 years (Tarasuk & Mitchell, 2020) - a number that has increased even more so due to the COVID-19 pandemic. Thus the underlying cause of food insecurity is low income. Food insecurity can therefore be a social issue because it is a result of income inequality since marginalized families are most likely to suffer from a lack of adequate food thereby, compounding into even more health problems.

Leading up to the COVID-19 pandemic, 12.7% of Canadian households were experiencing food insecurity despite the government's investments in agriculture (Tarasuk & Mitchell, 2020). Food banks are currently challenged to maintain and expand their capacity to address food insecurity and are a necessity to the most food insecure households (Deaton & Deaton 2020). Between April 2017 and March 2018, food banks in Ontario provided support to almost 230,000 households, with nearly 400,000 households identified as experiencing food insecurity (Feed Ontario Hunger Report). This report is critical of Ontario's management of the rising cost of living, claiming that social security transfers have stagnated while the cost of living has risen. This issue is particularly pertinent to seniors, with food banks reporting that 46% of seniors using the food bank are relying solely on their Old Age Pension as their income.

Food Banks are typically sustained by the donation of non-perishable goods from members of the community. A common issue associated with this is the lack of fresh, local food, as well as animal products such as eggs, meats, and dairy. Considering that the government of Canada recently revised its National Food Guide to advocate for a reduction in the consumption of animal products, and an increase the consumption of local and nutritious whole foods, what supplements the food bank inventory should reflect the national food guide as well. School gardens can help achieve this goal.

School Gardens

River Valley – Nova Scotia

In 2016 a team of researchers drawing on arguments proposed by authors Ralston (2011) and Baker (2006) set out to gather data on the impact of Canada's first school garden designed to build community food security. The argument made by Ralston is that 'school gardens are a steppingstone to lifelong participation in organized garden projects, and that these types of projects are sites of place-based political action for community food security (Raslton 2011). Baker, emphasizes the benefits urban agriculture has had in Toronto's urban centers and also argues that 'urban agriculture have become important aspects of the community food security movement, promoting alternative food networks that improve access to food and encourages

people to 'delink' from the global corporate food system' (Baker 2006). In conjunction with this argument, other theories suggest that school gardens are effective tools for project-based, emergent learning opportunities that build local and visceral knowledge (Carlsson et al). Carlsson's study was inspired by challenges to school gardens faced due to their measurement indicators, and a lack of understanding mechanisms for how school gardens can contribute to community food security.

The results indicate that school gardens are a powerful learning tool for elementary school students with regards to food-related knowledge, skills, and values that encourage participation in sustainable food systems. These gardens were funded through provincial and municipal supports. Hence why school gardens are an important part in the shift toward sustainable food systems because the students are able to analyze the long-term implications of their food choices – which is an act of public participation (Baker). Students benefited from this program by:

- gaining knowledge about gardens and food system
- an enhanced willingness to try new food that they themselves had grown
- Practical gardening skills to be used at home
- Food preparation such as harvesting, cleaning, cooking
- An awareness of gardening activities and local food availability
- Respect for food producers and stewardship for the environment

These benefits are elemental to the concept of sustainability, and therefore beneficial to community food security (Carlsson et al). Despite this, implementing school gardens have delayed due to a lack of time, funding, and volunteers. The most successful school gardens Carlsson observes have a committed team of teachers, volunteers, and funds. One potential solution to the lack of volunteer is to incorporate strong partnerships between schools and community-based food organizations.

A critical component of sustainable development is the idea of intergenerational equity. One solution to the lack of volunteers may be to offer post-secondary students studying agriculture, horticulture, and other food security subjects the chance to act as leaders in the community when it comes to coordinating the garden efforts. In addition, the government may wish to have school garden service be a mandatory component in the required 40 high-school volunteer hours to graduate in Ontario.

Canadian Feed the Children (CFTC)

CFTC is a registered Canadian charity that strives to eliminate child hunger. In a published blog, the organization argues that school gardens are effective to reinforce lessons on healthy eating, while making healthy food more accessible to communities such as Toronto First Nation schools, and after-school programs in Montreal. They recognize the importance school gardens have on food security, citing Olivier de Schutter's recommendation that school garden programs be funded as community-based strategies to combat

hunger and food insecurity in Canada, which is high and on the rise. Canada and Ontario both report a staggering 12% of households experiencing food security as of 2018 * (King & Quan 2019).

An analysis of the impacts school gardens have shown that these programs connect children to the environment and teach them important practical skills that sensitize them to the issue of climate change and its impacts. It's influence also extends to the wider community regarding the significance of proper nutrition, which has ultimately evoked a sense of community belonging and pride (CFTC). Communities with school gardens typically rally around the students, supporting them in the planting and tending of the garden as well as the harvesting, preparation, and preservation of the food. Benefits also extend to an improvement in community health since the increase in the consumption of nutritious food grown in the gardens results in a reduction in obesity and other health issues. School gardens have proven to educate youth on healthy eating habits at an early age which they can later carry into their future. Additionally, school gardens have proven to improve students' confidence to become active members of their communities and responsible stewards of their environment' (CTFC).

Agriculture and the Environment – Impacts and Consequences in the Context of Food Security

The agriculture industry is confronted today with environmental limitations in terms of soil and water, and the fact that prices for food production inputs are rising compared to the price of food. Since the 20th century, the agriculture industry has produced many negative externalities, such as soil erosion, water pollution, and increased emissions, surmounting to a total 1/4th of global greenhouse gas emissions (DeFires 2014). 69% of Canadian crop farms applied commercial fertilizers and herbicides, while 15% report using insecticides (AAFC 2017). Ammonia emissions from farmers' increased application of insecticides grew by 104,000 tones between 1985-2011. One of the most detrimental consequences of increased use of fertilizers in farms in southern Ontario has contributed to harmful algae blooms in Lake Erie that are detrimental to the health of the ecosystem and people. In Ontario, 25% of farms are at high-risk for nitrogen contamination in water, and 16% of Ontario farms are very high risk (AAFC). An increase in phosphorus use is being credited to the trend of intensification of livestock, which in rainier seasons increases the possibility of phosphorus runoff contaminating the water. Additionally, with the increase in synthetics used in fertilizer also comes with an increase in cost to producers costs which contribute into the rise in food prices. The impacts of these synthetics were realized in the 2008 Food Crisis, when the cost of oil skyrocketed, consequently food became unaffordable.

History is set to repeat itself given the increasing scarcity of oil and the growing dependency on synthetic inputs to sustain increasing crop yields. This trend in increasing synthetics in farming activities is problematic, particularly when the provincial government is putting increased pressure on farms to increase their yields. These

statistics indicate an already precarious situation faced by the agriculture industry that may not be able to sustain an increase in demand from prolonged population grown and economic opportunity. Due to urban sprawl, damage created by these types of externalities will continue to increase. 1.5 million acres of agricultural land have lost to urban development (OFA 2016), representing not just a loss of food production, but also a massive loss of natural capital and critical ecosystem services needed to ensure a sustainable and functioning economy. This agricultural capacity needs to be restored within the city to mitigate food insecurity. Thus, by Ontario having over 4900 publicly funded schools has tremendous capacity to achieve this goal by supporting a provincial school gardens program. Land utility is becoming increasingly important, as more land becomes developed, cities are having to maximize the ecological utility of their urban and peri-urban spaces, especially in the wake of climate change awareness.

Empirical Findings

Data from Statistics Canada (2019) and PROOF Canada (2020) indicate that food insecurity in Canada has been on the rise since 2007. Between 2007-2008 (See Annex, Graph 1.1), the reported national incurrence of food insecurity was 7.7%, rising to 8.6% by the end of 2012 (Graph 1.2), and again to 12.5% by 2018 (Graph 1.3).In cities where community and school garden programs have been a success such as Montreal and Vancouver, food insecurity in their respective provinces rose from 6.9 (QC) and 7.7(BC), to 12% (QC) and 13% (BC) by 2018, having seen a reduction in their food insecurity prevalence compared to 2017. Ontario in contrast, rose from 8.2% of households being food insecure by the end of 2008 to almost 14% in 2019.

The dramatic increase in household food insecurity from 2007-2018 refutes the benefits school gardens implemented in this time frame are having on food security. Unfortunately, there exists no empirical data to support the theory that school gardens have an impact on lowering the incurrence of food insecurity in the communities they support. There exists only tertiary research regarding the testimonies of families and individuals directly involved with the few school gardens across Canada who claim the benefits school gardens offer to the community. While food insecurity is lower in provinces with well-funded school garden programs, considerations need to be made to the social programs existing in different provinces. In response to this observation, I argue that the handful of existing school gardens are alone not going to have an impact on the food insecurity of an entire province. Considering this, Ontario has land assets in over 4900 publicly funded schools across the province. This represents a significant amount of land of which it's utility could include a food produce social service.

Results

While more evidence is needed to observe any measurable impact school gardens have in improving community food security in Canada, there exists much research demonstrating the benefits school gardens have to the overall health of the community,

as well as the scientific evidence supporting the environmental benefits of urban agriculture. Typically, school garden programs are implemented in communities experiencing marginalization, and are adopted in response to this reality. The benefits to the community are not enough alone to have a significant reduction in overall regional food security however, notable benefits are still experienced fully by the communities managing these school gardens, particularly the participating students.

Studies on school gardens only focus on the normative and positive implications the gardens have on the students, particularly their dietary health and class engagement levels. While scarcely noting the impact school gardens have on reducing food insecurity. This is likely due to the ethical questions concerning the use of children in the mitigation of social issues. Some critics of school garden programs argue in areas where grade averages and student performance are declining schools should not be burdening children with the responsibility of growing food, and instead should invest in education that would improve grade results.

I disagree with this mentality, since an investment in education targeted at urban agriculture infrastructure would provide the opportunity for an increase in hands-on, interactive learning activities in the curriculum that would better engage students compared to orthodox classroom etiquette and digital learning spaces.

Discussion

In the context of Canadian federalism when it comes to managing environmental problems, regional approaches are being acknowledged as important approaches (Belanger 2011). While food security is indeed a social problem, it is also intrinsically environmental. Climate change continues to be a wicked and complex problem that has far reaching implications to every aspect of civilization and challenges the sustainability and feasibility of industrial farming activities. As the cost of living continue to rise, and pressures on our natural resources are compounded by increasing demands from a growing population and degrading environment, innovative solutions must be put forward to carry us sustainably into the future.

Rather than simply increasing industrious food output, by investing in policy solutions with community organizations through bringing farming and education together are the next steps in reducing the presence of food insecurity in Ontario. Quebec and British Columbia are examples of provinces with lower food insecurity insurances than Ontario, both of which have more stronger policy frameworks pertaining to urban agriculture. Implementing a Public- School Garden policy will empower communities with the tools they need to not only grow their own food but educate the next generation on the importance of local food in our health and our natural environments. However, until a vast majority of schools in Ontario are growing food, school gardens will not be enough to reduce the occurrence of household food insecurity, additional action is needed from governments in terms

of addressing the problems associated to the rise in the costs of living.

The overall goal of a school garden policy would be to reduce the incurrence of food insecurity by donating the produce grown to the surrounding school community. Ultimately, school gardens funded by a provincial policy should serve the community as seen fit by the community members, relying on support and feedback from local organizations. For example, if the school is located close to community housing, they might wish to collaborate directly with that neighborhood. School gardens in more affluent neighborhoods might choose to send their produce to areas in the city that need the most support such as direct donations to local food banks, or high-risk neighborhood.

There exist additional challenges for inner-city schools lacking open spaces to install a garden plot as well, since they may not have enough space to spare. Roof top gardening provides an opportunity for schools in highly dense areas of the city to still produce food without having to convert their already limited available space. Roof top gardens have been highly successful in New York City, as well as in Montreal where some grocery stores have converted their rooftops to functional garden spaces. Additionally, aquaponic systems that allow for produce to be grown in vertical towers in classrooms with soilless growing mediums, offer another alternative approach to growing food in limited space.

There is no obvious contingency plan in the event industrial agriculture's yields start to decline due to degrading natural resources and difficult decisions need to be made to ease the tension for meeting food demands in international and domestic markets. The literature analyzed in this article demonstrates the need to find local solutions to food security problems as a precaution to when environmental degradation results in diminished crop yields. Investing in urban agriculture on school properties will allow for the proliferation of alternative food networks throughout the province, bridging social justice and environmental issues through local empowerment (Baker 2008). Community food projects have proven to promote social and cultural components of local, sustainably grown food that expand and deepen cultural and ecological vision and mold citizenship (DeLind 2002). Producing food on school properties as a food security initiative is a triple pronged initiative to address income inequality, climate change, and education performance in public schools. School gardens offer potential to act as a buffer in the event of declining yields, but only following significant investments in urban agriculture infrastructure.

Conclusion

Deep ecology begs us to question our ends and values in an ecological context and consciousness and funds our sense of well-being by involving ourselves in an active way with the natural world. Considering the increase in exposure to digital screen-time in response to the COVID-19 pandemic, the increase in urban population sizes, and the decrease in available park spaces within

cities, the opportunity for people to reconnect with nature (and each other) has become a scarce resource in of itself. Interacting with nature is a integral component in human spirituality, as human beings are part of nature, and not separate from it. As governments look to solve many of the crises facing their populations, solutions need to be presented in an ecological context as to preserve the quality of the environment for future generations to thrive as we do today. Adaptive collaborative approaches in natural resource governance, such as school garden programs offer such solutions. This is the foundation of sustainable development, and an important consideration in the argument of a provincial school garden program. The time to act on food insecurity and climate change in Ontario is more critical now that before the COVID-19 pandemic.

Annex

Data from this chart was compiled from the 2017 'Overview of the Canadian Agriculture and Agri-food System'. Moderate ratings indicate a risk of environmental damage if no action is taken, and poor ratings indicate a high risk of environmental damage. Regression indicators are used when the natural resource column has experienced a decreased rating in its last two reports. This data is important for the environmental justifications for school gardens, as it identifies risks of continuing the status quo in the agri-food sector.

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