

Lessons Learned during the COVID-19 Pandemic on Farm to School Programming as a Tool for Food System Resiliency

**by
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B.Env. (Global Environmental Systems), Simon Fraser University, 2020
Geographic Information Science Certificate, Simon Fraser University, 2020

Project Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Resource Management (Planning)

in the
School of Resource and Environmental Management
Faculty of Environment

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SIMON FRASER UNIVERSITY
Spring 2023

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Ethics Statement

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Abstract

Food security is a prevalent issue across Canada. Programs such as Farm to School B.C., work towards providing food literacy education in schools and supporting school meal programs. However, the COVID-19 pandemic challenged the continuance of school food programming, especially when schools were forced to close and reduced in person operations to transition to online modes of teaching. This study seeks to better understand how the COVID-19 pandemic exposes the gaps in the food system through assessing its impacts on Farm to School B.C. programming. Understanding the challenges and opportunities that resulted from the pandemic are crucial for understanding how we can better prepare for future emergencies. The findings will assist planners and policymakers in their efforts to support food security and strengthen food systems resiliency for students and communities across British Columbia.

Keywords: school food; food system resiliency; COVID-19; emergency preparedness

Dedication

I would like to dedicate this work to two people who have inspired me and helped me grow as a student, an academic and an active member of my community.

To Kit Bjornson, for inspiring me through all that you teach, and for the wonderful mentor you were in my formative years.

To Ralf Dauns, North Vancouver's The Soup Meister. For feeding the community and seeing the best in everyone you encountered.

I'm thankful for your teachings, and your inspirations.

Acknowledgements

I am deeply grateful for the opportunity to live, learn and grow on unceded Coast Salish Territory, of the xʷməθkʷəy̓əm, Skwxwú7mesh and Səlílwətał Nations, the rightful caretakers of this land that I call my second home.

I would like to thank Dr. Tammara Soma for her incredible guidance and support throughout my degree, and a wonderful mentor and role model in academia. I would like to thank Richard Han of Public Health Association of B.C., and Claudia Páez of Farm to School B.C., for their insightful knowledge throughout this study, and for the incredible work they do for our community. I would like to thank my peers from the Food Systems Lab for the wonderful community you cultivate for a place to learn about all things food. I am grateful for my friends and family who have supported me throughout this work, as they are my inspiration for wanting to better my community.

I would also like to acknowledge that this research was funded by the Social Science Humanities Research Council Partnership Development Grant.

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Chapter 1. Introduction

Food insecurity has grown in Canada, and is almost four times more prevalent in children than in adults (Liu et al., 2023). Food insecurity is characterized by many factors such as economic constraints to obtain food, available infrastructure for food systems, as well as available resources (Mui et al., 2022; Tarasuk et al., 2022). In 2021, 15.9% of Canadian families experienced food insecurity, this equates to around 1 in 5 children in Canada (Tarasuk et al., 2022). This has only been exacerbated by the global pandemic. The global COVID-19 pandemic has created new physical barriers to food access especially in the transportation and distribution sectors (Niles et al., 2020), and also for people's mobility (Rajasooriar & Soma, 2022). The strain put on food systems during the pandemic exposed our overreliance on food production models that are dependent on global supply chains (Clapp & Moseley, 2020). In addition, the pandemic made it clear that food related work must be deemed as essential, as grocery store staff and other food providing organizations were considered "frontline" workers who provided critical services for food distribution (Raja, 2020). Due to the lack of previously established infrastructure to support local foods and lack of priority for the matter, the pandemic exposed the shortcomings of the dominant industrial food system (Raja, 2020).

The right to food seeks to support food security efforts and is recognized by the United Nations. It states that food must be adequate and accessible, especially for vulnerable individuals such as children (Committee on Economic, Social, and Cultural Rights, 1999). Many school-aged children rely on school provided meals through school food programs - this is approximately 388 million children globally (Coalition for Healthy School Food, 2018). However, the COVID-19 pandemic posed numerous challenges for the continuance of school food programming and school meals in many countries such as the United Kingdom, the United States, as well as in Canada (James et al., 2021); (Jablonski et al., 2021); (Coulas et al., 2022).

Farm to School B.C. (F2SBC), a program of the Public Health Association of British Columbia (PHABC) has provided support for school meal and food literacy programming within the province. This organization works to connect academic institutions including educators and students with their local community food systems through various programs - for example, hands-on learning opportunities, promotion of

healthy eating, funding school gardens, and more (PHABC, 2023). F2SBC operations are organized into eight Regional Hubs across the province and are composed of relevant clusters of school districts. Each Regional Hub is coordinated by a Community Animator and an Advisory Committee, where food programming is supported and administered. This organization provides the framework necessary for schools to administer food programming , including bringing healthy local and sustainable foods to schools, and teaching food literacy to students (PHABC, 2023).

Working in partnership with PHABC and the F2SBC school meal programs, this study seeks to better understand the impact of the COVID-19 pandemic on the food security of students through F2SBC programming, and to identify lessons learned on how we can more efficiently prepare for emergencies in the future, and the role of a planner in doing so. Food systems resilience during disruptive events, such as climate change and pandemics, requires an understanding of the nature of emergencies, the importance of establishing relationships with key actors, and addressing systemic causes of inequalities in food systems (Moore et al., 2022). The role of local governments in achieving food system resiliency is crucial, as they are equipped with the local tools required to respond to emergencies (Moore et al., 2022). They have the power to shape local food environments through zoning laws, and understand the unique needs of a local municipality by responding through local government agencies such as school districts, to ensure food security for children (Moore et al., 2022). F2SBC programming supports food sovereignty by connecting students to local farmers, which enhances food literacy through community relationships to local foods (Powell & Wittman, 2018) and therefore contributes to food systems resiliency.

This study draws upon key informant interviews (n=15) with Regional Food Hub coordinators, farm to school animators, school district staff and volunteers, and relevant policymakers. This research aims to address the following objectives:

1. To identify the gaps in school food related programming, through identifying the lessons learned during the COVID-19 pandemic.
2. To learn how we can strengthen our food system resiliency, to better inform planners and policy makers in emergency preparedness efforts.

The lessons learned in these key findings will aid policy makers, planners, and educators in ways in which local and regional food systems can adapt and improve for future emergencies. At the onset of the pandemic, many schools had to limit their operations, move their programming virtually, or cancel altogether. When assessing reopening policies, it was found that school reopening plans focused on COVID-19 transmission safety and overlooked the many benefits of school food programming (Coulas et al., 2022). Therefore, this study aims to provide recommendations and guidance for various levels of government in addressing food related challenges with emergencies, and to ensure food does not become an afterthought.

In exploring and better understanding how participating F2SBC schools responded to the effects of the pandemic such as the adaptation of their programming and social distancing rules, we can identify challenges and opportunities for strengthening school food programs for future emergencies which can contribute to food security and food system resiliency. The structure of this paper is as follows: Chapter 2 *Literature Review* discusses the global effects of the pandemic on food security, the impact on Canadians specifically, and the role of planners in food planning and school food security. Chapter 3 *Methodology*, discusses the methodology used for conducting this research, including the questions asked of each participant, and how the results were obtained. Chapter 4 *Research Findings*, discusses the findings for this paper, generated in three themes: (1) Initial responses to the pandemic, (2) Impacts of COVID-19 restrictions (3) Human and physical infrastructure (4) Financial gaps and opportunities (5) Policy implications. Chapter 5 (Discussion) explores the impact of this research and its findings and explores the roles of policy makers and planners in addressing the opportunities which arose from this study. Lastly, Chapter 6 will conclude the implications of this work.

Chapter 2. Literature Review

2.1. COVID-19 Global Impacts

Globally, the COVID-19 pandemic has impacted food systems in several ways, for example, through the movement of food due to global lockdown measures, employee illnesses, and loss of jobs as a result of layoffs (Clapp & Moseley, 2020). In an attempt to maximize the efficiency of the food system, through methods such as specialization, trade, and more, it has become a complex web where its functions are greatly impacted and disrupted by the global pandemic (Clapp & Moseley, 2020).

In Canada, the food system is riddled with gaps and challenges from farming, to production and distribution, that affects everyone involved including farmers, food industry workers, and consumers (Raja, 2020). Prior to the pandemic, existing challenges such as economic and spatial inequalities were prevalent throughout the food system. Rural areas, for example, are not prioritized for supermarket growth due to lower populations, and in comparison, urban populations often suffer from lack of access to affordable and healthy foods (Mui et al., 2022). Since the beginning of the COVID-19 pandemic, several research efforts have been made to better understand the impact of the pandemic on Canadians. With increasing risks to food security due to natural disasters such as climate change, and concerns around the impact of the global pandemic, ensuring food system resilience has become a growing focus for planners (Mui et al., 2022); (Raja, 2020).

2.1.1. Economic impacts on food distribution, affordability, and consumption

The food manufacturing industry, Canada's leading employer, plays an important role in the country's economy - contributing to 1.7% of Canada's GDP and 19% of the country's employment opportunities (Hailu, 2020). Negative supply shocks, food shortages, and distribution disruptions have greatly impacted food security among Canadians (Hailu, 2020). Further, supply and demand shocks in the Canadian food processing industry contributed greatly to food insecurity (Hailu, 2020). These shocks come from an increase in demand for food but a lack of availability as COVID-19 travel

restrictions prevented the ease of movement of highly demanded food products (Hailu, 2020).

Although Canadians have been spending more time at home since the start of the pandemic, the percentage of Canadians cooking at home and learning new recipes (practices that contribute to food literacy) was much lower than expected (Agri-Food Analytics Lab, 2021). This being said, of those surveyed in this study, only 39.5% of Canadians know the concept of food literacy adequately enough to explain it, and 55.9% of Canadians have prepared most of their meals themselves during the onset of the pandemic (Agri-Food Analytics Lab, 2021). Two main factors considered when measuring food insecurity in Canada is affordability and household income (Deaton & Deaton, 2021). Canadians earning over \$75k a year tend to know more recipes than other sampled tax brackets (Agri-Food Analytics Lab, 2021). Similarly, research conducted by the Food Insecurity Policy Research (PROOF) indicates the following:

“While the relationship between household income and food insecurity is not a perfect one-to-one relationship, the probability of food insecurity decreases as household after-tax income rises and this pattern is most dramatic at very low levels of household income.” (Tarasuk et al., 2022, p. 18)

These findings highlight the inequalities to food access with lower income families experiencing higher rates of food insecurity during the pandemic due to barriers such as transportation costs, long line-up times at grocery stores and food banks, and inconvenient schedules of non-profit food hubs that are important for families needing to access adequate food (Rajasooriar & Soma, 2022). It is important that schools continue providing healthy meals to students in order to decrease the food insecurity gap between students from low socio-economic backgrounds, and those of higher socio-economic backgrounds (Vamos et al., 2021).

2.1.2. Impacts on children

During the pandemic, households with children were found to be more food insecure than households without children. This often led to further undesirable conditions such as poor physical and mental health (Coulas et al., 2022). A case study conducted in the United Kingdom found that school closures disproportionately affected students who relied on school provided meals. Additionally, students who relied on

school provided meals were found to have consumed around 21% less fruits and vegetables due to a disruption in access to these meals (James et al., 2021).

When funding was available, food programs in schools continued during school closures, especially in the US, but greatly limited their services (Jablonski et al., 2021). For example, schools that fed students daily, often reduced their services to only twice a week (Jablonski et al., 2021). Therefore, while meal services continued, the lack of government direction and support for adequate distribution posed a challenge for schools (Jablonski et al., 2021).

2.2. Role of Planners in Food Systems Resiliency and Food Systems Planning

Unfortunately, it took a global pandemic to shift public perception and awareness on the importance of planning for food systems resilience. To ensure better planning for potential disruptions, planners have an important role when it comes to food. In 1999, a survey found that senior-level planners in 22 US based agencies did not know the extent to which planners could be involved in food issues (Pothukuchi, 2009). It was further identified that planners had a reactive rather than comprehensive approach to food related matters (Pothukuchi, 2009).

Planners also play an important role in food security and resiliency in their area of work. Using food related public policy and comprehensive plans, local governments have the opportunity to strengthen food systems and implement real change (Raja et al., 2018). However, due to several barriers such as limited available information for people about their cities, there is a lack of mention of food systems within local governments, which results in a lack of awareness of food related issues (Raja et al., 2018). It is also important to note that most food related policies only focus on specific industries such as agriculture (Raja et al., 2018). Raja also found that presently, planners are more inclined to use zoning regulatory tools, whereas, mechanisms such as financial and infrastructure support are less common but more beneficial in food systems planning, (Raja et al., 2018).

A planner's goal in addressing food related challenges is beyond just food security. It is also about supporting the broader social movement that supports localism

and public health concerns and to forge the relationships required to build resilient food systems (Pothukuchi, 2009). The enhanced benefits of caring about food adds to the broader greater good of food systems, and considers social justice and sustainability in the long run as well (Pothukuchi, 2009). Food planning benefits extend beyond food itself, and create positive impacts on our economies, human wellbeing, ecological wellbeing, and equity for our local food systems (Pothukuchi, 2009). Most of the focus in food system policies have been around nutritional implications, yet as Pothukuchi explains,

“Political will for food system activities at the local level is arguably more effectively mobilized through arguments of economic benefits...” (Pothukuchi, 2009, pp. 365–366).

In addition, regional development plans often fail to prioritize social equity (Mui et al., 2022). However, planners have the opportunity to advance food equity by addressing food related issues through the decision making of other plans such as transportation (Mui et al., 2022). When the costs of transportation via truck and airfreight increased, as seen with COVID-19 travel restrictions, costs of transporting perishable foods were impacted and consequently, food prices increased (Clapp & Moseley, 2020).

Additionally, planners can contribute to the success of food policy implementations through monitoring and evaluation measures (Mui et al., 2021). This research will identify the gaps in the approach being implemented in B.C. and will help planners understand the role of schools in supporting more resilient food systems. Planners have the ability to use the tools available to them in their field to advocate for food and strengthen food systems in our communities.

2.3. School Food Meals, Resiliency and Food Security

Globally, school food meals are known to be the most effective driver of improving children's health (Ruetz & McKenna, 2021). In the year 2020, children in over 161 countries received school food meals funded by their respective governments (Ruetz & McKenna, 2021). An assessment of household food environments of families within the United States during the pandemic, found that children were consuming more meals at home due to social distancing measures and decreased socialization (Adams et al., 2020). This meant that families purchased less fresh produce and more shelf

stable, non-perishable foods leading to fewer fresh options and less healthy eating habits for children (Adams et al., 2020). Students living in less food secure households, without access to school provided meals, consumed more of these unhealthy meals, further contributing to their food insecurity (Adams et al., 2020). In addition, in the U.S., lack of health and food literacy is directly correlated with low socioeconomic status (Vamos et al., 2021).

It is important to better understand the role of school meals in strengthening food systems resiliency and food security, as students who are disproportionately impacted in a negative manner are usually those with a low socio-economic status, ethnic minorities, and those with disabilities (Vamos, Wacker, Welter and Schlüter, 2021). It has also been identified that supporting food nutrition programs through various channels such as partnerships with food programs can alleviate some of these effects (Vamos, Wacker, Welter and Schlüter, 2021).

A study conducted in Canada which investigated the extent in which school food programs were affected by the provincial and territorial school reopening plans, identified that decision makers did not address school food programs in their reopening plans (Coulas et al., 2022). Moreover, they often overlooked the impacts of school provided meals and failed to provide effective guidelines of program delivery to schools (Tarasuk et al. 2022). Similarly in the U.S., Jablonski et al., (2020) identified that more federal guidance is required for handling school food programming during the pandemic. A survey by The American School Health Association also indicated that participants required more funding, staff, and government support for the continuation of school food programming during the pandemic (Chrisman & Alnaim, 2021).

Emergencies such as the pandemic, expose the gaps in our food systems. The COVID-19 pandemic exposed an opportunity window to study its impacts on Farm to School programming, where we can draw conclusions about the gaps in our food systems. These gaps can be addressed through providing policy implications that professions such as planners can use to strengthen local food systems to better prepare for future emergencies.

2.3.1. Case Study: Brazil

In the country of Brazil, the school food program, *Programa Nacional de Alimentação Escolar*, PNAE has been in place since 1955 (Coalition for Healthy School Food, 2018). This program provides meals to 43 million students in public schools (Barbosa et al., 2023). Brazil's National Education Development Fund (FNDE) allows for the federal government to distribute funds to local levels of government to allow for the implementation of their school food programming (Barbosa et al., 2023). These funds must be used for the sole purpose of procuring school food throughout the duration of days in which schools are in session (Barbosa et al., 2023). In Brazil's model during the COVID-19 pandemic, there were several adjustments made to accommodate for their food programming (Lourenço et al., 2021). In May 2020, the municipality of Campos dos Goytacazes decided to distribute food kits to students that contained ingredients for meals that met PNAE's menu requirements (Lourenço et al., 2021). They did this through hiring a third party organization to help with preparation and distribution of meal kits (Lourenço et al., 2021). In the municipality of Macaé, a municipal law (Law 4676) was established, stating that they would distribute funds as an emergency aid in the amount of 200 reais per month to students enrolled in the public schools of their municipality (Lourenço et al., 2021). Both municipalities stated that there were challenges receiving timely guidance from the federal government, allowing them to go forward with their adaptation methods mentioned (Lourenço et al., 2021). This being said, we have the opportunity to learn from countries like Brazil in their emergency preparedness efforts to address school food.

Chapter 3. Methods

3.1. Research Context

This study was conducted across British Columbia, Canada, where the Public Health Association of BC's Farm to School BC program (PHABC F2SBC) operates. F2SBC aims to bring healthy, good food, that is local and sustainable, to over 300 schools across British Columbia (PHABC, 2023). F2SBC operations look different within every school based on resources available, geography of the community, and operational capacity of each unique school. Although each F2SBC initiative may be different, all of the programming operate with the following three elements in mind: (1) healthy, local food; (2) hands-on learning; and (3) school and community connectedness (PHABC, 2023).

Some of the F2SBC initiatives currently being implemented, and the ones looked at by this study, are school and community gardens, microgreens, salad bars, farm visits, and cooking classes.

This research was conducted because of the COVID-19 pandemic that emerged early March 2020. With the evolving nature of this novel pandemic, the Federal and Provincial Governments of Canada developed restriction measures across the country, provinces, and within health regions, that greatly impacted the operations of school food programming. The aim of this study is to assess these impacts and identify lessons learned in improving the food system.

3.2. Research Methodology

This study received ethics approval from The University Research Ethics Board (REB) of Simon Fraser University. It focused on K-12 Schools in British Columbia, Canada and sought to identify the gaps in school food programming, through the exploration of how the COVID-19 pandemic exposed already-existing weaknesses of the food system within B.C. schools. Furthermore, this study also aimed to identify how these gaps can be addressed through the role of planners.

There has been a conscious effort to include voices from a wide variety of regions within B.C. to understand pandemic responses throughout the province. Key informant interviews were conducted with participants (n=15) across various roles in relation to F2SBC programming, such as teachers, volunteers, non-profits, community partners and experts, and local government officials. The interviewees were selected due to their various roles in relation to F2SBC programming. The interviewees were chosen to represent a range of key actors in F2SBC operations in various roles. The interviewees were selected and contacted from a list of recommendations made by F2SBC and snowball sampling (Marcus et al., 2017). The interviews were conducted on Zoom and ranged from 30 minutes to 45 minutes and took place between November 2021 and April 2022.

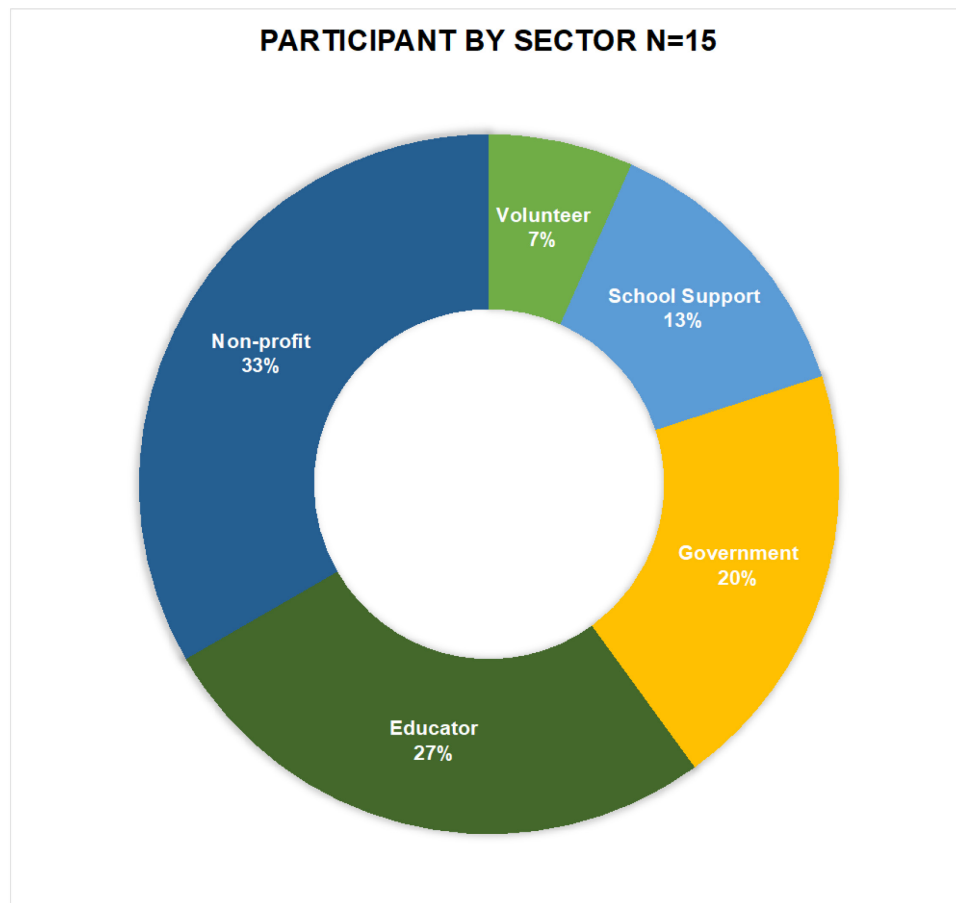


Figure 1. Research participants based on sector (n=15)

Participants were asked a series of 10 open-ended, semi-structured questions in a chronological order of events, starting with identifying the role of the interviewee. Next, pre-pandemic approaches to food program delivery were explored, followed by questions about adjustments that were made by the interviewees to their school food programming throughout the pandemic. Participants were then asked what worked for the school food program during the pandemic and what could have been improved. Lastly, the interviewees were asked about the barriers they faced and their recommendations for policy change in supporting and scaling up school food procurement.

The interviews were transcribed using the Otter.ai software for further analysis. The interview question responses were coded using the software NVIVO. The interview responses were categorized and coded based on their corresponding questions with key themes, beginning with pre-pandemic methods, to farm to school program delivery, to initial responses, adjustments, evaluation of what worked best, and recommendations of the interviewees. The same 10 questions were asked of all the interviewees, and their responses were compared to identify patterns and key findings.

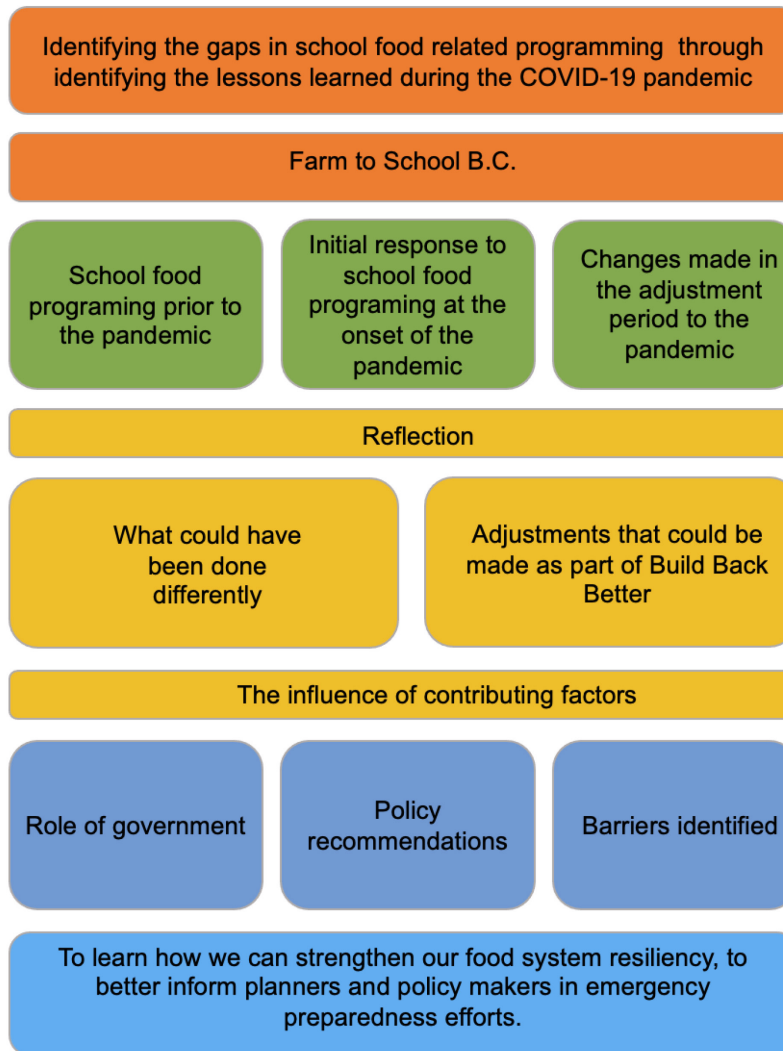


Figure 2. Research structure, starting with research objectives; research interview questions by category; synthesis of data through reflecting on participant responses; identified opportunities for key actors; lessons learned

3.3. Limitations

This research contains several limitations. This study was conducted with a sample size of (n=15) which captures a small portion of the experience of F2SBC supporters. This also means that the participants may not represent the experience of all schools and regions where Farm to School programs operate. Although this sample size does not capture a large range of responses, it is still justified, as the individuals interviewed were well representative of the population considered for this specific context (Boddy, 2016). In addition, this sample size does not allow the opportunity to

capture the socioeconomic status of each school within each region and is limited only to the schools which participated. Second, the interviews were conducted via Zoom, and although this platform allows for a larger reach where it is not possible to be in person, its use for interviews is limited to those who have access to the technology required. Lastly, this study does not capture the experience of the students themselves, and instead only captures the experiences of the adults involved.

This research does not take into considerations Indigenous perspectives and Indigenous foods systems. In order to effectively create and make recommendations for a more resilient system in the case of an emergency, a study of this kind must understand and take into considerations the colonial implications of our food systems and the historic interference of settlers with Indigenous food systems through the prevention of Indigenous peoples from engaging in their traditional food practices (Cooke, 2009).

Chapter 4. Findings

Several themes emerged from the results of the interviews that are discussed in this section. The findings of this study can be generalized in the following chronological order: (1) Initial response to the pandemic; (2) COVID-19 restrictions in schools; (3) Infrastructure issues including both physical and human barriers; and (4) Monetary concerns (funding). Importantly, these findings are a reflection of the gaps in school food related programming within the province that have only become more prevalent throughout the course of the pandemic.

Interviewees made several observations that helped identify some gaps in food programming, especially during the pandemic. Interviewees then made recommendations that were categorized into the following overarching themes, that would help strengthen this system and increase the food system resiliency. The findings are grouped together based on these main themes that emerged from this study, and were frequently mentioned by participants: 1) Initial responses by the schools to the pandemic; 2) Uncertainties caused by COVID-19 restrictions in schools; 3) Infrastructure issues including both physical and human barriers to and administrating F2SBC initiatives; 4) Monetary concerns (funding); 5) Policy gaps that prevented the implementation of programming to its full potential, and 6) Opportunities for addressing these concerns.

4.1. Initial Response to the Pandemic

4.1.1. Transitioning to online model of food program delivery

When asked what interviewees would have done differently as a response to the pandemic, it was noted that interviewees would not have done anything differently due to the uncertainty of restrictions, school programming formatting, and COVID restriction timelines. Instead, educators focused their efforts on transitioning their programming online and adjusting in their lessons to fit the online platform of teaching.

“I mean, I don't think you could have really done anything different. Only because this isn't really happened to us as a culture before in my lifetime. And I think in the past, the technology didn't exist to do what we've done. Like, it's actually quite phenomenal, what we've been able

to do, right, and technology has really increased rapidly because of the pandemic.” (Non-profit supporter 1)

Due to the provincial Ministry of Education’s COVID-19 restrictions, food programming across the (country/province) had to stop entirely or be moved online. Educators such as “foods teachers” (teachers that teach a course on food), transitioned their teachings to online platforms. For example, one interviewee, a foods teacher, mentioned that they used Instagram to create a page where their students had the opportunity to remotely share their cooking. However, transitioning to an online platform such as Instagram, did not allow for the full experience of being in a foods class. The teacher had to require students to purchase ingredients and cook from home, and since most of this preliminary transition occurred during the onset of the pandemic, many ingredients were not readily available which posed a challenge for both the educator and the students.

“...And you were instructed not to go to the grocery store. So, you need to go and buy these ingredients to make this dish didn't seem really great. So, for me, it was more just trying to keep in touch with students. And if they sent me stuff awesome, if not, also fine, but the cooking side of things really fell off...It was like March, April, May June. Another three or four months we were totally shut down and just online only.” (Educator 1)

Some meal preparations had to stop completely, as educational content and transitioning students to online education was an immediate priority for schools. Further, it was also noted that educators were being cautious of the types of meals and ingredients they were requiring their students to purchase for preparation at home due to the lack of availability of groceries, rationing, and the increasing cost of ingredients.

4.1.2. Beyond students

Of the schools which participated in this study, many of them reported an increase in the number of families requesting gift cards and hampers in numbers that they did not anticipate. Some schools attempted to continue to provide meals to students through frozen meal programs and distribute them through feeder schools in their catchment area.

“So where we used to feed, you know, that child in that classroom, it obviously isn't right to just go “Oh, so you know, we know there's one child that needs food in your family”, and you remember only sending

food for the one child, that's part of what drove us to say, we got to give more when a family comes to pick up food, this isn't just about feeding that one kid, it's about the family." (Consultant 1)

Similarly, another interviewee mentioned they created breakfast wraps that were distributed to students in need of a meal through school staff doing deliveries, but this initiative was not continued, as the infrastructure was not established to ensure a sustainable model of food delivery.

"So, we did it a couple of times where we just made some breakfast wraps, froze them and then sent them out to elementary schools in the district. And it was one of the district principals who was doing the driving. And it was just a way to give meals for any students that showed up who needed a breakfast." (Educator 1)

Alternatively, in one school district where there are existing specialized roles for foods related programming at the district level, food educators were able to create pre-packed hot meals for students to access.

"...Sort of like emergency food programs, so that families initially it was the prepackaged hot meal programs that some students had a subsidized free program to access. So, they could come and pick up like five pre prepared meals that are not necessarily great quality, but at least it was something...And then we added in like seedlings and seeds and a little bit of school grown food and families could come and pick that stuff up. So, we set up a few sites in the district. And once word got out through district emails and social media, and soup, we had like 100 families coming every week. And then when they decided school was back on with a lot of restrictions in place." (Educator 4)

4.2. Restrictions

Educators stated that during the pandemic they were not allowed to enter their schools which had a negative impact on their work, as they were not able to continue their programming, preparation, and teachings where they left off. For example, this meant that their school gardens could not be taken care of and were abandoned. Additionally, volunteers and visitors were prohibited from entering schools. This was problematic for school food programming, as volunteers who help run programming, as well as guests could not attend schools to continue their work and support food literacy programming with children. Knowledge sharing was proven to be difficult with the prohibition on visitors and mandatory distancing by students and staff.

"To me, the social distancing is the biggest, I'll name it, I get why we need to do it from the COVID protocol. It doesn't work. When we're talking about the conviviality of sharing and eating and preparing food together...social distancing is a massive challenge. And it's also one that I can't recommend that we just get rid of it, because I don't think we can. But to me, the way that, the way that I dream of school food programs and farm to school programs in schools, they require people being a little closer together? Yeah, and people being able to mix and mingle." (Educator 2)

4.3. Infrastructure; Human and Physical

4.3.1. Human infrastructure

In general, interviewees identified a shortage of paid staff to deliver food programming. The already available staff are stretched thin in capacity and are unable to dedicate their full attention to programming. Schools do not have the capacity to fund, as well as administer programming. It was also mentioned that teachers must spend out of pocket to support programming.

"...just always more support for teachers so that they can kind of have the ability to take on those kind of projects, which feel just sort of extra at this point to the already large workload that they have, I would say more funding for these types of food education programs, and food systems education programs." (Non-profit supporter 3)

The issue of volunteer burnouts was raised by the participants.

"We're always struggling for volunteers; we have all the same people and they're going to burn out." (Volunteer 1)

Educators would like to see a role created to support all food related programming. Since volunteers are a huge support when it comes to programming delivery, in case of lockdowns and other emergencies, these volunteers are unable to attend schools. Therefore, having someone at the school district level to coordinate food related programming would be beneficial. As one participant noted:

"So, I think that's probably the barrier like human resources, whether they're paid or unpaid, like if they are around or not, and are there enough of them..." (Government 3)

4.3.2. Lack of physical infrastructure

Due to the pandemic, many educators identified the importance of physical space for programming. Many schools lacked the appropriate infrastructure, such as big open spaces, outdoor spaces, and kitchens for food education and preparation.

"...So, I just called them up and said, hey, can we do this in your kitchen? Can we borrow your kitchen and she wanted to charge me? And I said, oh, no, we can't afford that. We're a parents group trying to produce soup and salads." (Volunteer 1)

One educator mentioned the importance of their industrial kitchen at their school and is advocating for all new schools to have a built-in industrial kitchen for student learning.

"I would like to see a full-scale commercial kitchen put in there. And then hire out staff but also use students and turn that into a production facility for the district for meals for students in need." (Educator 1)

The importance of outdoor space was also mentioned by interviewees, where social distancing can be done safely.

"...As we've all learned, having outdoor space that's really set up well, would be really helpful. That would be really great for us to be able to, you know, keep offering our programming, even on days, like today, when it's very rainy. So yeah, having outdoor spaces that are specifically for that, I would say..." (Non-profit supporters 2 and 3)

Some schools stated that they have infrastructure that was previously established, such as garden boxes on school grounds, yet the issue was that they did not have capacity to maintain these educational gardens during the pandemic. These gardens were used for teaching students how to grow food, which contributes to their food security, through knowledge of growing and sustaining food.

"Some teachers that I talked to were just like, Yeah, we have, we weren't able to really take care of the gardens...So I think there was still, just like, with the transition to online learning, for some parts, like that was really challenging. And then even when we came back in September, and it's in person, but then secondary schools are online and in person, and then on the semester system, which really doesn't work with any garden programming or fruit programming." (Non-profit supporter 4)

It is important to note that although some schools lacked the infrastructure that they identified to be beneficial to their school food programming, many schools did not have the opportunity to use their already existing infrastructure to their advantage.

4.4. Lack of Funding

Almost all interviewees mentioned funding to be a barrier to their food program delivery. It was mentioned that educators would like more funding, and not just those that come from grants, but funding that is consistent and stable. In addition, educators noted that supporting local farmers can be difficult due to high costs.

“So, when it comes to funding, having ongoing commitments to fund those initiatives, programs like this, and a lot of other programs, nonprofits rely on volunteers, and champions. And so, when you have a teacher or school staff who is leading the way, and if they move on or they retire, then there's nobody else to take over the torch. Like, it's, it's just, you know, sometimes programs fall apart then.” (Government 3)

It was also mentioned that the ministry should provide opportunities for teachers to get involved in F2SBC initiatives. By this, it means to provide financial opportunities to teachers to support their work, to not take away from their capacity to educate students in their teacher roles. This requires making the commitment to fund farm to school initiatives and staffing to support programming in the long run.

To achieve this, participants emphasized the importance of stable funding to support their work. Educators mentioned that in some instances, they must dip into their own financial resources and their own time to contribute to their school foods initiatives.

“...It goes back to funding because everything in life does... And we happen to have the kids in our buildings, but it's a fundamental human right, and somebody should make sure that this is covered accordingly. And it shouldn't be on the backs of schools with that are working with already very limited budgets to actually educate kids.” (Consultant 1)

4.5. The Need to Integrate Food in School Policy

A need for an overarching school food policy was mentioned as a key concern. Educators want to see student nutrition be a higher priority on the Ministry of Education's agenda. Food security has been dealt with at the school level, and educators want to

see action at the district level as well. They identified that the COVID-19 pandemic has brought forth an opportunity for policy makers, F2SBC supporters, and food systems resiliency advocates, to take a step back and evaluate the capacity of educators to support school food programming beyond their teacher roles.

“...COVID is also a catalyst to getting creative, to help break down silos, to not create this illusion that schools can do it all, because no one system can...You know, I think people were doing what they couldand they just were in crisis mode...” (Consultant 1)

In order to work towards a resilient food systems, the capacity of teachers must be acknowledged and realized, and where additional tasks are required, teachers and educators must be supported through funding, better policies, and additional help to ensure a sustainable workload for all.

Chapter 5. Discussions and Recommendations

5.1. Discussions

5.1.1. Engaging families and community ins school food programming

The increased interest expressed by adults and families around school food meals beyond the children in schools is an indication that support for food security is needed and extends beyond students and is a representation of potential food insecurity at the home. Similarly to the findings of this study across B.C., at the onset of the pandemic, many other school food program initiatives across Canada also transitioned to providing food boxes and gift cards (Ruetz & McKenna, 2021). Due to COVID-19 restrictions, many foods related initiatives resorted to frozen takeout meals and gift-cards for students and families, yet this temporary solution does not address the root of the food insecurity problem in schools. Moreover, charity-driven forms of support are not long-term solutions to food insecurity in emergencies (Coulas et al., 2022).

On several occasions, educators who provided food programming through third party community partners, as well as school educators noted that adults in their community became more interested in food related programming during the pandemic. More adults came to farmers markets and were expressing their interests in programming for adults. Several Farm2School partners noted the spike in adult interest in food preparation, food literacy education, and cooking amongst adults. They noticed a spike in farmers market attendees, and requests for recipes and materials such as seedlings for people to grow at home. This demonstrates the importance and need for food literacy opportunities for all ages, as the impacts of school food programs move beyond the students and often benefit the broader community.

5.1.2. Uncertainties of restrictions

Participants stated that at the onset of the pandemic, restrictions and recommendations for best practices were not yet well defined, and teachers felt as if they were left on their own to figure out how to carry on their programming. Although several participants stated that their food related programming was moved online, this

only allowed for the continuation of the food literacy aspect of food programming and did not account for students who needed access to meals. By using online platforms such as social media, teachers were able to remain in contact with their students and encourage them to learn to create different meals. This approach did come with limitations, as it imposes barriers to student learning, due to some families having limited access to electronic resources. In addition, a teacher interviewee mentioned that they had to be mindful of the types of meals they were suggesting students to prepare, as access to ingredients was difficult due to grocery store shortages and supply chain disruptions (Hailu, 2020).

Historically, school food initiatives have been reliant on volunteers to carry out their programming and community-raised funds (Coulas et al., 2022). Interviewees understand the challenges associated with this model of program organization and delivery and are seeking for a more reliable and stable structure to allow for their programming to run smoothly. Interviewees stated that they would like to see a role within the higher levels of government, where a funded role is made for a liaison or coordinator who they can contact for support on high-level administrative details of school food initiatives such as F2SBC. This role could be at the school district level, or at the Ministry of Education. Similar to the responses from the interviewees, the literature also confirms a lack of a standardized monitoring system through jurisdictions in regard to maintaining school food programs and providing assistance and support for educators (Ruetz & McKenna, 2021). In terms of policy implications, agency is an important concept, as it reiterates the importance of measurement efforts (Clapp et al., 2022). Having someone in this type of role will also be beneficial to parents navigating resources to find access to school food programming. Since each school has its own unique program, it can be challenging for parents to navigate the available subsidies, and it was stated that without direction, these resources are hard to navigate (Single Mothers' Alliance, 2022).

5.1.3. Funding opportunities

In the 2018/2019 school year, it was found that 50% of funding for Canadian school food programs come from Ministries of Education (Ruetz & McKenna, 2021). Other sources of funding included Ministries of Health and Ministries of Social Services, as well as Ministries of Indigenous Affairs (Ruetz & McKenna, 2021). It is important that

food programming is continuously funded by the government, not only to ensure programs are being sustained, but also to ensure a safety net in case of an emergency. In British Columbia, there are no specific school food policies, but provincial nutritional guidelines are provided, with the expectation that school district will implement them (Bodnar, 2022). Additionally, although food procurement is tracked by health authorities in order to study the rate of BC food consumption, food procurement data is not tracked for schools by school districts or governments, creating a gap in data availability (Bodnar, 2022). To do so would require adequate infrastructure and funding, which is not yet implemented (Bodnar, 2022). By tracking this information and recognizing the importance of schools as part of the food infrastructure, we can ensure schools are recognized for funding opportunities. The report *Food System Resilience: A Planning Guide for Local Governments* prepared for Johns Hopkins Center for a Livable Future, identifies attributes of resilient food systems in the form of a checklist, where capital reserves were identified to be needed as backup resources in the case of an emergency event (Moore et al., 2022). Backup resources are explained in three categories. (1) In order to assess resilience for the system under question, the food providers need to have social, financial, natural and political resources to tap into during a disruptive event, (2) a resilient system should incorporate an assessment of the available financial resources, (in this case being funding from governments and other sources) and (3), there needs to be an analysis of the staffing situation; are there enough staff to support the operation, or does it rely on volunteers (Moore et al., 2022). Other ministries that should have an input on, and support these efforts are the Ministry of Emergency Management and Climate Readiness, and the Ministry of Social Development and Poverty Reduction.

The limited structure for Farm to School programming, does not allow for allocation of responsibilities during emergencies of this kind. This creates a barrier to successfully feeding students in a time of events such as the pandemic, where these resources are needed the most. School food programming providers such as teachers, should not be paying out of pocket to support their initiatives. It is estimated that monetary contributions from teachers to purchase for students is around \$4 million dollars per year (Ruetz & McKenna, 2021). There is a need for financial support for educators, to ensure a sustainable operation for students, that supports teachers to operate programs within their capacity.

5.1.4. Utilizing available infrastructure, and opportunities for growth

With the rollout of social distancing and COVID-19 restrictions, along with the gradual return of students to schools, educators became creative with their food program operations, and used the unique resources available to them to carry out their operations the best that they could. This meant using the unique features of their school and community, such as the layout of their schools, their available infrastructure, and the culture of their community.

For example, in the Sooke District, a school had over 100 families coming to pick up pre-packaged meals once a week. These meals were prepared with ingredients obtained from a Community Supported Agriculture program, CSA. This model worked well but once classes were back in session in person, students did not receive meals at schools except for those from a local First Nations community who were at school for over eight hours during the day who received school prepared meals. Through another collaboration, the Vancouver School Board provided a partnership with LunchLAB's Chefs for Families where students were able to pick up food prepared by professional chefs (Fresh Roots, 2023).

Some schools had access to established infrastructure such as kitchens, outdoor spaces, and outdoor gardens, while others had to adapt accordingly. Schools that have access to these spaces were able to carry on with their food initiatives more effectively, and even benefitted from outdoor time. Schools in B.C. vary in their capacity to support programming through forms of funding and resources such as physical infrastructure of schools. This causes inequities, as not all schools have access to the same resources. According to the 2020 K-12 Public School Food Survey conducted by B.C Stats, 80.1% of schools in B.C have a full kitchen which contains the basics of a kitchen, (BC Stats, 2020), the findings of this survey identify that these resources are not being used to their full capacity. Although the majority of schools have a "full kitchen", this form of set up cannot be used to its full potential for preparing and feeding students at a large scale, hence advocacy for industrial kitchens.

The Ministry of Education's Area Standards outlines specific guidelines for educational spaces for K-12 schools. Section 2.65 *Teaching Kitchen* under section 2.6 *Middle and Secondary Schools* outlines "With the approval of the Ministry, a teaching

kitchen may be permitted for a school enrolling at least 600 students in grades 11 and 12” (Ministry of Education, 2012).

For the most part, educators are creative and resourceful in their adaptation strategies, to better school food program delivery. Depending on the school location, structure and layout, some schools are better equipped to handle disruptive emergencies, such as the pandemic. This highlights the inequalities in available infrastructure throughout the province and must be addressed through the implication of appropriate policies. The following chapter discusses these policies and opportunities.

5.1.5. Developing policies

It is becoming more prevalent that there is a need for a system change, that goes beyond the need for food in schools, but a change that focuses on a system that makes accessing food easier for educators and builds resilience for accessing food during an emergency such as the pandemic. Interviewees call for policies to address these gaps, and to support the work done by educators in the food system sphere. Educators have stated that they would like to see student nutrition as a priority for the Ministry of Education and other relevant policy maker groups. During an emergency such as the COVID-19 pandemic, school reopening plans through the provinces and territories, was focused on reducing transmission of the disease throughout schools and classrooms (Moore et al., 2022). This drew resources away from feeding children that did not necessarily return once restrictions became clearer and schools settled. It is also important to note that amongst the G7 countries as well as amongst the member organizations for Economic Cooperation and Development (OECD), Canada is the only country without a national school food program (Coulas et al., 2022). Canada has the resources required to strengthen food policies and to create a national school food program, and with their recently announced commitment to a national school food policy, these recommendations can help shape this policy.

Similar to the findings of this research, in their report *Comprehensive, integrated food and nutrition programs in Canadian schools: A healthy and sustainable approach*, Hainez and Ruetz discuss policy recommendations that align with those found in this study. Firstly, policies to address food insecurity, must be income-based solutions and not food-based, in order to address the root cause of food insecurity (Tarasuk et al.,

2022; Haines & Ruetz, 2020). Secondly, in order to ensure a well-functioning system, stable funding for human resources and physical infrastructure is required (Haines & Ruetz, 2020). This being said, if teachers are to work outside of their scope and capacity, it must be discussed with their respective union and negotiated in their contracts to prevent exploitation of their resources (Haines & Ruetz, 2020).

Schools are places that are more than a place for formal education. Schools provide a space and an opportunity for students to learn and grow academically, socially, and as people. Food is a major part of that learning, and therefore schools should be seen as community hubs for resources such as food education and access. As stated by farm to Schools programs have the ability to meet the goals of food sovereignty through providing meals, but also providing food literacy in schools (Powell & Wittman, 2018). Therefore, as a place of learning, schools are essential and an important piece of food sovereignty.

5.1.6. The role of planners

The role of planners is important when it comes to planning for food systems. Through tools such as comprehensive plans, planners can incorporate food security (Raja, 2018). This research is important in aiding policy makers, as a significant barrier to addressing food systems issues at a government level, is due to the lack of awareness of food security issues (Raja, 2018). Findings from this study can be shared with policy makers. It has become clear that for planners to effectively bring the attention of policymakers to food security, they must focus on the economic benefits of addressing food security issues, and by focusing on these economic impacts to capture the attention of policy makers, planners have the opportunity to support food systems beyond the economic benefits, as food planning ensures the ecological, and social well-being of our communities as well (Pothukuchi, 2009). Addressing the impacts of the COVID-19 pandemic on food security is economically important as 41.6% of households who mainly relied on pandemic related government benefits such as the Canada Recover Benefit (CRB) and CERB were food insecure (Tarasuk et al., 2022). By addressing these barriers, planners have the opportunity to better prepare for future emergencies such as the possibility of another pandemic.

5.2. Recommendations

Through implementation of policies created by policy makers, planners can ensure equitable distribution of resources based on the unique needs of each community and their schools. Furthermore, there is an opportunity for the creation of a national school food policy whereby these recommendations should be considered, based on the lessons learned from the COVID-19 pandemic on school food operations.

It is important to acknowledge the colonial implications of our food systems today, and that although this research does not address Indigenous food systems, it is important to note that Indigenous food sovereignty is an important piece in strengthening our food systems, and their considerations must be included in every step of building back better through supporting Indigenous educators in their unique needs to strengthen our emergency preparedness efforts.

Table 1. Recommendations made from findings of the "Lessons Learned during the COVID-19 Pandemic on Farm to School Programming as a Tool for Food System Resiliency" research.

Preventative Measures
1. Address food insecurity at the household level using financial measures such as income-based solutions for families, in order to alleviate student food insecurity.
2. When possible, provide timely and detailed instructions on emergency protocols tailored to the school institution and their operations
Financial Measures
3. Governments (federal and provincial) should provide guaranteed continuous funding to ensure sustainable and ongoing school food programming.
4. Governments (federal and provincial) should provide guidance on navigating funding resources and opportunities for educators throughout the application process.
Opportunities for Policy
5. Evaluate existing infrastructure in schools and identify new opportunities to support operations during emergencies at the school level. Consider the importance of the following. <ul style="list-style-type: none"> • School gardens/ School farms • Large open outdoor and indoor multi-purpose spaces • Industrial kitchens
6. Provide compensation for educators to acknowledge additional work hours.
7. Manage paid staff to volunteer ratio for school food programming to ensure sustainable program delivery so that educators and volunteers are working within their respective capacity.
Food Infrastructure
8. Consider schools as being important food hubs, and an important infrastructure for food access for communities, especially during an emergency event.

Chapter 6. Conclusion

With the ongoing issue of food security in Canada, planners should always be aware of the ways in which disruptions, such as emergencies like the pandemic affect the functions and drivers of our food systems. By identifying gaps in the school food system during the COVID-19 pandemic, we are presented with opportunities for the improvement of the system. These opportunities for improving the school food system can be shared with policy makers, to ensure better preparation for future emergencies, and to minimize disruptions to achieving food security of children in our communities.

The role of policy makers and planners are important in several contexts. Through policies that provide financial support to school food initiatives, the inequalities of food access and the disparities between low-income households and households of higher socioeconomic backgrounds can be reduced. The literature shows that food insecurity is tied to financial security (Vamos et al., 2021), and by ensuring funding for, and through programs such as F2SBC, organizations can help address food security and tighten these gaps. Schools are also places of education where children have the opportunity to grow and learn life skills that will guide them throughout adulthood. When we ensure student food literacy through food education within schools, we are cultivating a culture of food secure students who are knowledgeable about growing food, cultivating food, and creating healthy meals.

It is important to recognize schools as important institutions during emergency events, as they serve the community in many ways as a place for educating future generations, as well as critical food infrastructures for children and their families as seen in this study. By doing so, we are addressing a larger problem of household food insecurity, as food insecure children are an extension of food insecure households. Therefore, with the help of policymakers to provide financial means for educators, and with the help of planners in the implementation of these policies, engagement with stakeholders and the distribution of goods and services, we can work towards a more sustainable and secure food system. The effects of healthy food secure children ripple beyond schools and aid in the development of healthy and food secure communities.

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