

# **Addressing Food Insecurity in Nunavut: Policies to Support the Local Harvesting and Commercialization of Food**

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# **Approval**

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## **Ethics Statement**

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## **Abstract**

Locally harvesting and commercializing food has the potential to reduce food insecurity levels in Nunavut. Local food harvesting and the consumption of traditional food is a fundamental component of cultural identity, cultural stability, and community solidarity in Nunavut. Nonetheless, current solutions often focus on decreasing the price of market foods through subsidies, thus making it easier for food to be shipped into the territory from southern suppliers. This research paper explores the main identified drivers of food insecurity, the impact food insecurity has on health, the existing policies already in place, and a combined policy solution consisting of four integrated programs that could reduce food insecurity levels in Nunavut. The integrated policy solution considers implementing territorial Country Food Markets (CFM), a Food Acquisition Program, a School Meals Program, and a school-based arctic greenhouse initiative program under the Nunavut Harvester Support Program (NHSP). Analysis is based on a literature review, four jurisdictional scans, and thirteen expert semi-structured interviews. This report recommends government consider implementing all four programs under the Nunavut Harvester Support Program, beginning as pilot projects in three territorial communities of divergent size (small, medium, and large) and administrative capacity following additional research undertaken in Nunavut. These policies could help address some of the barriers existent in current programs offered under the NHSP and some of the main drivers of food insecurity in the short-term. Additional long-term solutions that address the growing threats climate change has on hunting (including shorter hunting seasons, changing animal migratory routes, and declining species) are necessary.

**Keywords:** Nunavut; Food Insecurity; Local Harvesting; Commercialization; Policy Options; Country Food Markets; Food Acquisition Program; School Feeding Program; Arctic Greenhouse

## **Dedication**

This project is dedicated to my brother, Jasun Fox, for his guidance and support. Thank you for enabling me to overcome countless challenges and for encouraging me to never stop pushing myself.

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## Glossary

Food Security:	Defined as “all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (Statistics Canada, 2012, p.1).
Food Insecurity:	Defined as “the inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so” (Dietitians of Canada, 2012, p.1). Food insecurity is often associated with a household’s financial capabilities to access adequate food. It is important to note “household” measures assess the food insecurity situation of adults as a group and children as a group within a household, not the food insecurity status of each individual member residing in the household (Statistics Canada, 2017). Therefore, it cannot be assumed all members of a household share the same food insecurity status (Statistics Canada, 2012).
Marginal Food Insecurity:	Defined as “worrying about running out of food due to lack of money” (Proof, 2017, p.1).
Moderate food insecurity:	Defined as “compromises in quality and or quantity of food due to lack of money” (Proof, 2017, p.1).
Severe Food Insecurity:	Defined as “missed meals, reduced food intake, and no food intake” (Proof, 2017, p.1).
Commercialization:	Defined as “the process by which a product [such as food] or service is introduced into the general market” (Investopedia, 2017, p.1). It considers the harvesting, distribution, marketing, sales, and customer support

required to achieve commercial success (Investopedia, 2017).

**Local Harvesting of Food:** Defined as “foods that are grown, farmed, or hunted close to the places of sale and preparation”. Local food production connects food producers and food consumers in the same geographic region (Feenstra, 2002, p.1).

**Traditional Food:** Food that have been passed through generations or have been consumed for many generations (Kristbergsson, 2016).

**Market Food:** Foods made for high production, factory production, and mass markets (Linane, 2015).

# **Executive Summary**

## ***Policy Problem:***

In Canada, food insecurity is particularly acute in the territory of Nunavut, as 37.2% of Nunavut households compared to 8.4% of Canadian households are identified as food insecure (Statistics Canada, 2012). Nunavut's food insecurity problem has increased over time; from 33.4% to 37.2% between 2005 and 2012 (Statistics Canada, 2017).

Food insecurity in Nunavut is strongly associated with a variety of negative health outcomes, particularly among Indigenous Nunavummiut. Ferguson (2016) finds that disease rates among Inuit Nunavummiut are 185 times higher than non-indigenous Canadians.

A variety of programs and initiatives have been undertaken on the federal, territorial, and non-governmental level. Although existing policies may help reduce food insecurity levels, many programs have been criticized for their ineffectiveness. The most notable federal policy response, the Nutrition North Canada (NNC) program, focuses on reducing the high costs associated with stocking and transporting perishable foods by directly subsidizing northern retailers, country food processors, and suppliers (Nutrition North Canada, 2017). A 2014 report by the Auditor General of Canada criticizes NNC for inadequately passing the subsidy on to consumers, not requiring information from retailers to verify compliance reviews, failing to identify eligibility based on need, and lacking proper performance measure strategies (Office of the Auditor General of Canada, 2014).

The most notable policy response on the territorial and non-governmental level, the Nunavut Harvester Support Program (NHSP), provides financial assistance to eligible harvesters for harvesting activities through five different programs. A review of the NHSP by an interdepartmental working group (which included extensive consultations with Inuit harvesters and communities and interviews with 125 stakeholders) criticizes the program for the lack of operational funding, insufficient support for full-time hunters, inadequate program integration and consistency, underutilization and inaccessibility of program benefits, and partnerships between government departments and agencies (Tunngavik, 2008).

There remains a significant gap in local policy solutions, particularly ones that support the local harvesting and commercialization of food. This report identifies the main drivers of food insecurity, the impact food insecurity has on health, the existing policies already implemented, and a combined policy solution consisting of four programs that could be implemented under NHSP to reduce food insecurity levels.

It is important to emphasize that these programs do not address the growing threats climate change has on food insecurity (including shorter hunting seasons, changing animal migratory routes, and declining species), the impact hunting quotas have on specific communities, and the impact the Firearms Act has on accessing hunting equipment. Although the policies examined in this report could address some of the drivers of food insecurity and potentially reduce food insecurity levels, these are short-term solutions. Additional long-term solutions are necessary to significantly reduce food insecurity levels in the territory. This project is also limited by the lack of local community engagement with populations most impacted by food insecurity. Further stakeholder interviews and local engagement (particularly among Indigenous Nunavummiut) needs to be conducted to fully examine the complex drivers of the problem, and assess whether the policies examined in this paper could be a component of an effective policy package to help address food insecurity.

***Methodology:***

This project uses a mixed-method research approach, beginning with a literature review, four descriptive jurisdictional scans, and thirteen in-depth semi-structured interviews.

***Policy Options and Recommendations:***

The combined policy solution considers four integrated programs. The first program is to implement Country Food Markets through Nunavut's communities where capacity is deemed achievable.

The second program is to implement a Food Acquisition Program. This program would directly purchase food from local markets (such as Country Food Markets) and distribute food to a School Meals Program.

The third program is to implement a School Meals Program, which would require that all schools provide meals to students attending public schools throughout the territory (including kindergarten, elementary schools, middle-schools, high-schools, and education centres for young adults). This policy would also require that a significant portion of food for the program be purchased from local suppliers, thus helping support local harvesters. This would be accomplished by primarily obtaining food through the Food Acquisition Program.

The fourth option is to implement a school-based arctic greenhouse initiative in public schools (including kindergarten, elementary schools, middle-schools, high-schools, and education centres for young adults) where capacity is deemed achievable. This program would require building an arctic greenhouse in public schools in the territory to grow fruits and vegetables that can be used for consumption as part of a School Meals Program. All excess produce would be donated to the local community through existing social organizations. In addition, a nutritional course for school credits would be offered to students, which includes a teaching component about the foundations of nutrition and an interactive component where students help plant and grow produce.

These four policy programs are analysed and evaluated through a consistent set of criteria and measures. These criteria are effectiveness, budgetary costs to government, ease of implementation and administration, and stakeholder acceptance.

This report recommends addressing food insecurity in Nunavut by implementing a combined policy solution consisting of four integrated programs, beginning as pilot projects in three territorial communities of divergent size (small, medium, and large) and administrative capacity. The recommended programs are not mutually exclusive, rather, implementing them in conjunction means each is further developed and supported. Country Food Markets would increase access to and the availability of traditional foods in local communities while supporting local harvesters. A Food Acquisition Program would help secure incomes for local harvesters and increase the amount of nutritious and culturally valued food in schools. A School Meals Program would improve the health of school aged children while helping support local harvesting by requiring that a significant portion of food for the program come from local suppliers. A school-based

greenhouse initiative would increase knowledge about and the consumption of nutritious foods among all Nunavummiut.

# **Chapter 1. Introduction**

The territory of Nunavut faces the highest level of food insecurity among all the provinces and territories in Canada with food insecurity at more than four times the national average in 2012. Statistics Canada (2012) finds that 37.2% of Nunavut households compared to 8.4% of Canadian households are identified as food insecure, with 18.9% being moderately food insecure and 18.3% being severely food insecure.

Nunavut's food insecurity crisis is particularly acute among Indigenous communities. The Canadian Council of Academics (CCA, 2014, p.16) finds that Nunavut has the "highest documented rate of food insecurity for any Indigenous population living in a developed country". In 2008, 68.8% of adult Inuit households (those over the age of 18 years) were food insecure, with 27.2% identified as severely food insecure (Rosol, 2011). For Inuit children, 70% of preschool aged children lived in food insecure households, with 25% identified as severely food insecure in 2008 (Egeland, 2010).

Inadequate food intake is strongly associated with negative health outcomes. Tarasuk (2013) finds that food insecurity is linked to nutrition deficiency, disturbed eating patterns, low levels of self-rated health (including mental, physical, and oral health), and numerous chronic conditions (including diabetes, hypertension, heart disease, anemia, and fibromyalgia). Among Inuit communities in Nunavut, Ferguson (2016) finds that food insecurity is correlated with numerous health consequences such as stroke, high-blood pressure, high-cholesterol, tuberculosis, heart attack, obesity, and various dental problems. For children, food insecurity negatively impacts behavioural and academic performances, cognitive functions, and psychosocial development (Egeland, 2009).

While several initiatives have been undertaken on the federal, territorial, and non-governmental level, the persistent and increasing rates of food insecurity suggest more needs to be done to address this problem (CCA, 2014). Currently, the most impactful policies place attention on decreasing the price of market foods through subsidies (such as Nutrition North Canada, NNC), thus making it less costly for food to be shipped into the territory from southern suppliers. Despite these initiatives, there is a significant gap in implementing robust local policy solutions that support the local harvesting and commercialization of food. There is a large body of evidence to suggest that local food

harvesting and the consumption of traditional food is integral to cultural identity, cultural stability, and community solidarity in Nunavut (CCA, 2014). Kuhnlein (2007) supports this by emphasizing that the consumption of traditional food (rather than market food) offers a variety of nutritional benefits for Nunavummiut (the people inhabiting the territory of Nunavut), particularly Indigenous populations that are at heightened risk of food insecurity. Despite cultural and health benefits, participation in harvesting activities and the consumption of traditional food continues to decline (CCA, 2014).

Food insecurity in Nunavut is a complex and multi-faceted issue, thus resolutions to the problem need to be holistic, since there is no single solution that will solve this issue (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). Solutions also need to take into consideration the distinctiveness of northern communities, traditional knowledge, and traditional ways of life among affected populations (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). To accomplish this, support for local food systems and economic development strategies could improve food insecurity levels. This study addresses the following research questions:

- What extent are Nunavut residents exposed to food insecurity and what are its main drivers?
- What practices have been adopted in other jurisdictions to increase the local harvesting and commercialization of food?
- What policy solutions could help increase the local harvesting and commercialization of food and what are the barriers of doing so?

This project uses a mixed-method research approach, beginning with a literature review, four descriptive jurisdictional scans, and thirteen in-depth semi-structured interviews. This project explores the main identified drivers of food insecurity, the health impacts food insecurity has on affected populations, the existing policies already in place, and a combined policy solution consisting of four integrated programs that could reduce food insecurity levels in Nunavut. The integrated policy solution considers implementing territorial Country Food Markets (CFM), a Food Acquisition Program, a School Meals Program, and a school-based arctic greenhouse initiative program under the Nunavut Harvester Support Program (NHSP). It is important to emphasize that this project is limited by the lack of local community engagement with populations most impacted by food insecurity in the territory. Further stakeholder interviews and local engagement (particularly among Indigenous Nunavummiut) needs to be conducted to fully examine the complex drivers of the problem, and assess whether the policies examined in this

paper could be a component of an effective policy package to help address food insecurity.

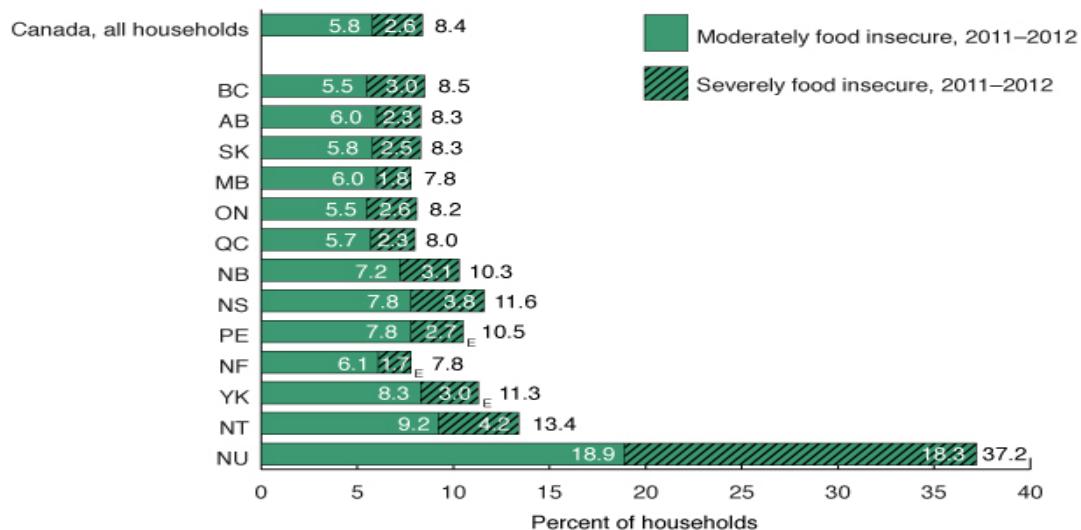
## Chapter 2. Background

### 2.1. Food Insecurity

#### 2.1.1. Canadian Context

Statistic Canada finds that 8.4% of Canadian households experienced food insecurity in 2012, with 5.8% being moderately insecure and 2.6% being severely insecure. This translates to roughly 1.1 million food insecure households, or 2.9 million people aged 12 and older living in food insecure households.<sup>1</sup>

Household food insecurity varies across Canada as shown in Figure 1.

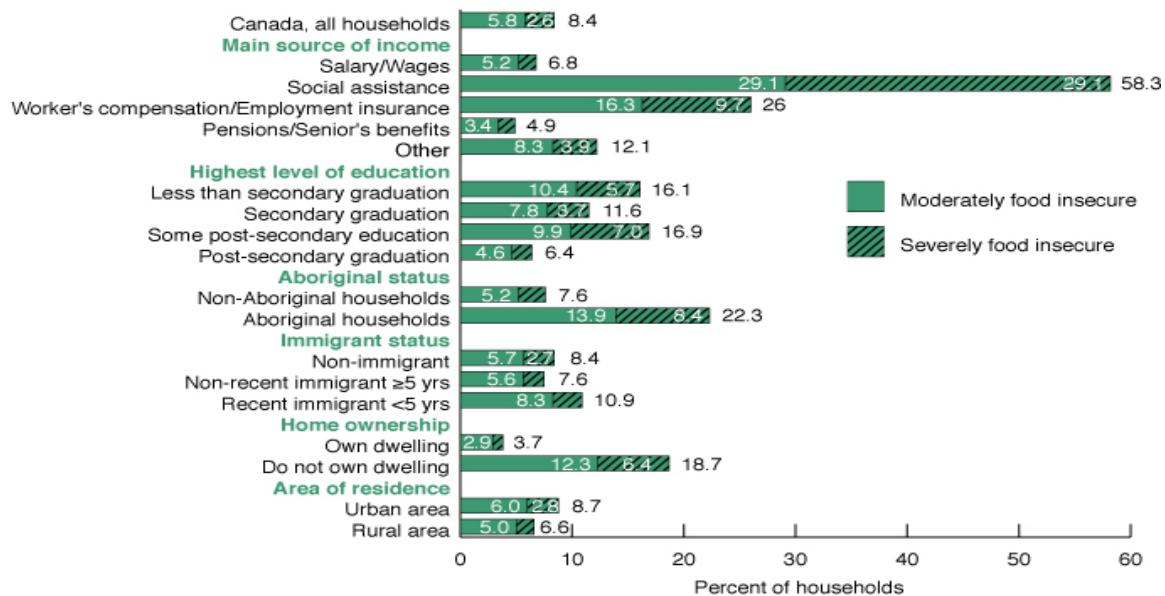


**Figure 1. Household Food Insecurity by Province and Territory, 2011 to 2012**

Source: Statistics Canada, 2012, Canadian Community Health Survey 2011-2012, Household Weights

Statistics Canada (2012) finds that food insecurity is most prevalent among households that relied on social assistance as a primary source of income, resided in urban areas, do not own their home, obtained lower educational achievement levels, are Indigenous, and are recent immigrants.

<sup>1</sup> Data obtained from Statistics Canada (2012)



**Figure 2. Household Food Insecurity in Canada by selected socio-demographic characteristics, 2011 to 2012**

Source: Statistics Canada, 2012, Canadian Community Health Survey 2011-2012, Household Weights<sup>2</sup>

## 2.1.2. Nunavut

Nunavut's food insecurity problem has steadily increased over time; from 33.4% to 37.2% between 2005 and 2012 (Statistics Canada, 2017).<sup>3</sup>

<sup>2</sup> It is important to note that the Canadian Community Health Survey excludes individuals "living on First Nations reserves or Crown Lands, full time members of the Canadian Forces, persons in prisons or care facilities, and the homeless" (Proof, 2014, p.8).

<sup>3</sup> Food insecurity data prior to 1999 is limited, since Nunavut had not officially separated from the Northwest Territories to become an independent territory

# **Chapter 3. Health Impacts of Food Insecurity**

## **3.1. Indigenous Nunavummiut**

In Nunavut, Kuhnlein (2007) finds that fruits and vegetables are not consistently available and meat products in stores are often preprocessed, precooked, or frozen for long periods of time. As a result, Inuit adults and children commonly rely on sugar, white bread, biscuits, lard, crystal powdered drinks, instant coffee, evaporated milk, corn flakes, frozen pizza, eggs, butter, and soft drinks.

As healthy eating is dependent on access to and the availability of healthy food, a variety of negative health outcomes have occurred among Indigenous Nunavummiut. Ferguson (2016) finds that disease rates among Inuit's Nunavummiut are 185 times higher than non-indigenous Canadians. Within Inuit communities, diseases linked to inadequate diets included diabetes, heart-attack, stroke, high-blood pressure, high-cholesterol, tuberculosis, coronary heart disease, and various dental problems. Obesity rates in 2010 were also 26% higher among food insecure Inuit compared to non-indigenous Canadians (CCA, 2014). Egeland (2010) supports this by highlighting that only 39% of Inuit's had a healthy body weight in 2008 (with 55% of women and 22% of men having an "at-risk" waist circumference). This may be due to obtaining large portions of energy from readily available and less-expensive high-sugar foods and drinks (Egeland, 2010).

Food insecure Inuit households lack access to key nutrients due to consuming fewer grains, fruits, and vegetables (Huet, 2012). Egeland (2010) finds that only 10% of participants under age 40 had the recommended level of Vitamin D. Food insecure Inuit's were also more-likely to report poor general and mental health, a lack of community belonging, a dissatisfaction with life, elevated stress levels, and cigarette smoking (Willows, 2011).

For Inuit mothers, food insecure households were found to lack basic maternal health which adversely affects their children due to mothers regularly missing meals and being nutrient deficient. This is evident as the infant mortality rate was three times higher for Inuit's compared to non-indigenous Canadians in 2011 (Ferguson, 2016). Life

expectancy at birth was also 10 years lower for Nunavummiut (mostly comprised of Inuit) compared to the rest of Canada in 2004 (CCA, 2014). Indigenous women who consume more traditional food, on the other hand, were found to be at lower risk of diabetes, cardiovascular disease, and contaminant toxicity. These women showed higher nutrient levels, including vitamin D, vitamin E, vitamin B6, proteins, riboflavin, iron, zinc, copper, magnesium, manganese, potassium, and numerous minerals (Kuhnlein, 2004).

Ferguson (2016) finds that children living in food insecure households show decreased physical and mental health levels, slower psychological development, decreased academic performances, and greater chances of developing depression and asthma. Feeding Nunavut (2017) further emphasizes that anemia and iron deficiency affects 37% to 48% of Inuit infants, compared to 8% of non-indigenous Canadian infants. In addition, Feeding Nunavut (2017) finds that over half of participating children are overweight, experience mental health issues, and are malnourished.

## Chapter 4. Drivers of Food Insecurity

The Nunavut Food Security Coalition (2014) outlines four predominate dimensions to the problem of food insecurity in Nunavut.

- **Availability** - including sufficient wildlife on the land or adequate quantities in grocery stores for populations
- **Accessibility** - including having enough money for hunting equipment or store-bought food and the ability to obtain it
- **Usability** - including having knowledge about obtaining, storing, preparing, and handling food
- **Stability** - including healthy food being available at all times of the year and food being culturally valued

Nonetheless, the drivers of food insecurity in Nunavut are complex and multi-faceted. Nunavut is distinct from the rest of Canada and its neighboring territories due to its vast coastline, numerous islands, thick sea ice, tundra, boreal forests, large clusters of lakes, dispersed communities, unpredictable weather patterns, and far reaching remoteness. The main identified drivers of food insecurity in Nunavut are described in the following sections.

### 4.1. Colonization – Traditional Food to Market Food

Prior to residential schools, Indigenous peoples comprise the vast majority of residents in the North-West Territories (including Northern Quebec, Northern Ontario, all of Manitoba, Southern Alberta, most of Saskatchewan, and a portion of the current Northwest Territories and Nunavut) (Government of the Northwest Territories, 2013). Food was primarily obtained from hunting and living off the land and traditional hunting customs were often passed on to future generations, thus equipping children and youth with adequate hunting knowledge and skills and providing a nutrient rich diet (Reagan, 2010).

From the early 19<sup>th</sup> century, these lands were attractive to Canadian settlers and federal policymakers, who “were looking to create a large domestic market for eastern Canadian industry, raise grain for export, and provide a route for a railway to the Pacific” (Government of the Northwest Territories, 2013; pg 22). However, legal requirements

that the Crown first deal with the Aboriginal title to the land prevented gaining control. First Nations leaders entered into the treaty-making process for the purpose of establishing mutual land-sharing agreements based on cooperation (Government of the Northwest Territories, 2013). Nonetheless, the federal governments policies and practices focused increasingly on “eliminating Aboriginal governments, ignoring Aboriginal rights, terminating the Treaties, and through a process of assimilation cause Aboriginal peoples to cease to exist as distinct legal, social, cultural, religious, and racial entities in Canada” (Truth and Reconciliation Commission of Canada, 2015). A central component of Canada’s Aboriginal policy was residential schools, which were established and active from 1876 to 1996 across Canada, with the last residential school closing in Nunavut in 1970 (Reagan, 2010). By 1931, “the government was funding eighty schools with a total enrolment of about 17,000 students” (Government of the Northwest Territories, 2013; pg 23). During this time, children were separated from their families, displaced in distant locations, and subject to horrific abuse. Occurrences of disease, starvation, and overcrowding were common. The death toll in 1907 among Aboriginal school children reached a high of 42%. The quality of education was also inadequate, as 40% of the teaching staff had no professional training and older students were often forced to work “half days” meaning they spent half the school day working and not receiving an education (Government of the Northwest Territories, 2013). Failure to send children to residential schools often resulted in severe punishments of the parents, including imprisonment. Aboriginal spiritual leaders were also jailed and Aboriginal spiritual practices were outlawed (Truth and Reconciliation Commission of Canada, 2015).

During this time Canada also asserted control over Aboriginal land through occupying and seizing specific regions by force. Among the negotiated Treaties with First Nations, many were fraudulent and coercive. Some First Nations were forced to relocate their reserves from agriculturally valuable or resource-rich land to remote and economically depleted regions (Truth and Reconciliation Commission of Canada, 2015). Additionally, Canada stripped away power from existing forms of Aboriginal government and disempowered Aboriginal women who held significant and powerful roles in many First Nations communities (Truth and Reconciliation Commission of Canada, 2015).

The Canadian governments pursuit of cultural genocide (the destruction of structures and practices that allow the group to continue as a group) has “assaulted

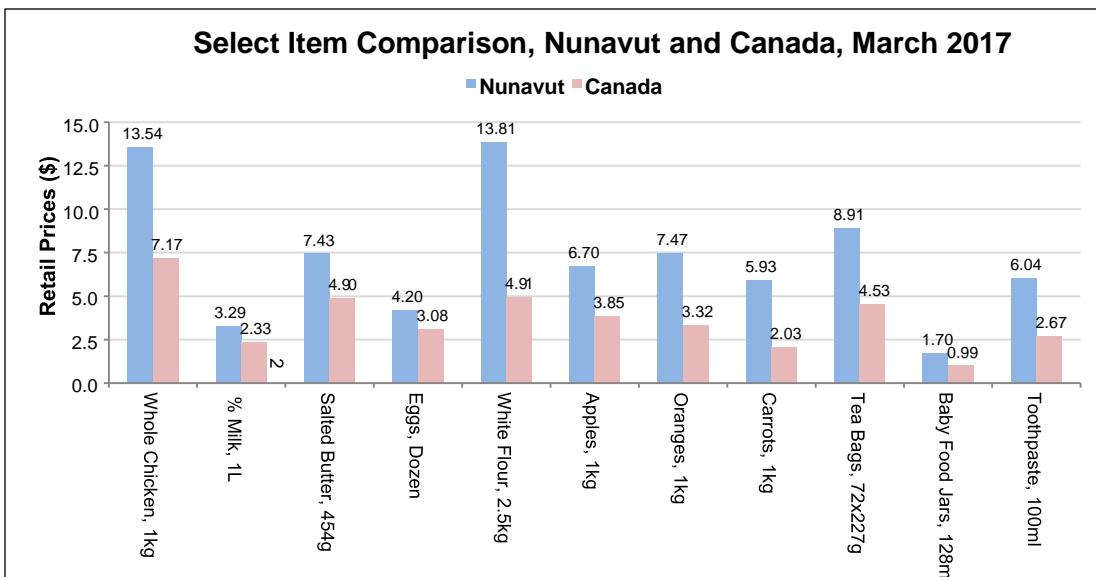
Aboriginal culture, language, spiritual beliefs, and practices" (Government of the Northwest Territories, 2013). This has negatively impacted the transferring of knowledge about hunting and the environment for entire generations, leaving youth with a lack of hunting capabilities (Truth and Reconciliation Commission of Canada, 2015). Chan (2006, p.3) further explains that Nunavummiut "are experiencing a nutritional transition [from traditional food towards westernized market-based food], resulting from a set of complex modernizing and industrial forces".

Apart from colonization, Kuhnlein (1996) highlights several drivers stimulating the dietary transition towards market food. These include declining plants and animal species, declining density of species, reduced time to harvest, declining land use, increased concerns about environmental contaminants, and the availability of and access to new market foods.

## **4.2. High Costs**

### **4.2.1. Market Food Prices**

Food is significantly more expensive in Nunavut compared to the rest of Canada. Huet (2012) finds that the average cost of groceries for Inuit households in Nunavut is roughly \$380 per week, \$1,317 per month, and \$19,760 per year. This is more than double the Canadian household average grocery costs of \$609 per month in 2007 (Huet, 2012). Since nutritious market food is expensive, and 49.6% of all Inuit adults in Nunavut earned less than \$20,000 in 2007, it is challenging for these populations to purchase market food that is nutrient dense (Egeland, 2010).



**Figure 3. Nunavut Food Price Survey, 2017**

Source: Nunavut Bureau of Statistics, 2017

#### 4.2.2. Transporting, Storing, and Distributing Costs

The elevated food prices are predominantly due to the high costs associated with transporting, storing, and distributing food. Many Nunavut communities are inaccessible by main loading roads and often require other modes of transportation. These same communities commonly lack sufficient fuel for sale and proper transportation facilities, thus increasing the time it takes for food to be delivered. The more remote the community the greater the likelihood of food perishing, which is factored into food prices since perished food diminishes profits for retailers. This means the more remote the community the higher the price of food. For air access, many operators are required to carry sufficient fuel for a roundtrip, thus reducing space for cargo (CCA, 2014). Helicopters and airplanes require enough surface to land and take-off, meaning higher costs for longer landing strips or thick ice. As for ice roads, it is common for vehicles to get damaged, resulting in transportation costs often doubling. Building ice roads are expensive, since a one-kilometer ice road costs roughly \$3,500 to \$6,000 plus additional expensive land permits (CCA, 2014). In addition, climate change is shortening the length of time ice roads can function, meaning increased reliance on air and sea transport of goods.

#### **4.2.3. Retail Store Costs**

Costs associated with building and maintaining food stores are substantially higher in Nunavut than southern Canada. Costs are estimated to be three times more expensive than southern Canada due to importing skilled labour, higher construction costs, and higher maintenance costs on permafrost (CCA, 2014). A food store that could be built in six months in southern Canada can take over three years to complete in an isolated district. As a result, these costs are passed along to consumers in the form of higher food prices (CCA, 2014).

#### **4.2.4. Hunting Costs**

Hunting equipment prices have remained high over time, regardless of subsidies that encourage more hunting and the consumption of traditional foods. Action Canada (2014) explains that an all-season hunting outfit costs more than \$55,000, which is twice the medium yearly earnings of average Nunavummiut. Costs for additional hunting equipment (such as boats, all-terrain vehicles, rifles, ammunition, safety equipment, and maintenance) continue to increase (Gillies, 2016). Ferguson (2016) supports this by explaining that a weekend of hunting costs more than \$200 due to the high costs of fuel and ammunition. The Nutrition North Canada (NNC) subsidy has increased hunting costs due to not subsidizing items such as hunting gear that was previously subsidized under the Food Mail Program until 2011 (Action Canada, 2014).

#### **4.2.5. Housing Costs**

Although 51% of Nunavummiut live in public housing (Statistics Canada, 2010), the high costs of housing have also contributed to this complex problem as disposable income that could be used for healthy food is often spent on housing. An average one-bedroom apartment outside the city centre of Iqaluit costs roughly \$1,966 per month, a three-bedroom apartment outside the city centre costs roughly \$3,300 per month, and a four-bedroom can cost roughly \$3,575 per month. Basic utilities per month also range from around \$150 to \$355 per month (Numbeo, 2017).

#### **4.2.6. Medical Costs**

The costs of medications and services to treat chronic health conditions, often developed due to nutrition deficiency, requires additional expenditures. While most Nunavummiut may be covered for drugs under the Non-Insured Health Benefits (NIHB) program, other residents often pay more for medication due to living in the north. Pharmaceuticals, for instance, are substantially marked up alongside other products (Skura, 2016). For lower income households, these expenses create great challenges for purchasing healthy foods since disposable income is often spent on medication and medical services, thus increasing the chances of developing new health consequences (Tarasuk, 2013).

### **4.3. Geography**

#### **4.3.1. Inaccessibility**

Substantial variation in Nunavut's physical landscapes creates unique challenges in accessing nutritious food. With over 25 communities, large portions of the territory are spread out, remote, isolated, and inaccessible. The vast distances, harsh weather conditions, and sparsely located communities create barriers for delivering food and developing reliable infrastructure for food production, processing, and selling. The territory does not have connecting roads between communities, rather many roads are only accessible by air, water, or snowmobile. All communities are reliant on summer open-water access and there is a high likelihood of seasonal shutdowns, winter roads freezing over, infrequent transportation services, and low traffic density (CCA, 2014). Therefore, planning and preparing nutritious meals is often difficult due to the unreliable availability of nutritious food (Ferguson, 2016).

#### **4.3.2. Limited Food Processing and Distribution Facilities**

Limited food processing and distribution facilities restrict access to traditional foods for households without an active hunter. The territory is limited to three major processing facilities (Kitikmeot Foods in Cambridge Bay, Kivalliq Arctic Foods in Rankin

Inlet, and Pangnirtung Fisheries Ltd. in Pangnirtung), which produce a wide range of meat and fish products such as arctic char, caribou, and muskox. Additionally, limited storage capacity negatively impacts the commercial sale of traditional foods. Only fifteen Nunavut communities have a capable freezer to store hunted meats for extended periods of time (Action Canada, 2014).

## **4.4. Poverty**

### **4.4.1. Social Assistance**

Rising poverty levels, particularly among Inuit Nunavummiut, continues to increase food insecurity levels. Despite the influence of other factors, poverty affects the household's ability to purchase healthy food. Over 75% of Nunavut households that rely on social assistance as their main income source were food insecure in 2012 (Ferguson, 2016). Social assistance payments per individual or household varied depending on income, the number of dependents, geographical location of residence, and one's physical ability to work.

For income, median total annual incomes by all families (including families of two people, with or without children, and lone-parent families) reached \$67,860 in 2015. This was the lowest medium family income among all the provinces and territories in Canada in 2015. Unemployment is also high, with Nunavut at 13.2%, compared to the national average of 5.4% in 2017 (Statistics Canada, 2017).

## **4.5. Climate Change**

### **4.5.1. Hunters**

The growing threat of climate change further threatens food security. For Inuit hunters, ice flows are melting sooner and freezing later (making hunting season shorter), animal migratory routes have become less predictable due to changing weather patterns, and ice hunting has become more dangerous due to ice thinning (CCA, 2014).

Traditional animal species availability has also declined over the last 20 years, including the south caribou herd that has declined by 95% (CCA, 2014).

#### **4.5.2. Contaminants**

Contaminants in traditional food species (such as plants, fish, birds, and mammals) continues to increase due to climate change induced factors. These include changing precipitation rates, wind patterns, water systems, ice and snow coverage, and rising temperatures transporting contaminants. Inuit were found to contain the highest levels of persistent organic pollutants (POPs) and metals in 2012 (CCA, 2014). Other contaminants commonly found in Nunavut since the 1960s include organochlorines, cadmium, lead, radionuclides, and arsenic. Most of these contaminants are transported via air and sea from large industrial centres in North America, Europe, and Asia. Myers (2004) explains that the health risks associated with consuming contaminated traditional country food range from neurodevelopmental and reproductive disorders to negative carcinogenic and hormone effects. Ferguson (2016) supports this by emphasizing that visual recognition and memory impairments, lowered gestation periods, reduced head circumference, and reduced birth weights can occur from consuming contaminants such as POPs.

Changing air temperature and rainfall patterns are also causing food spoilage during the preparation and storage of food (CCA, 2014).

#### **4.5.3. Industrial Activity**

Despite the territory being a small greenhouse gas emitter, industrial activity (from mining, shipping, tourism, oil, and gas) is predicted to increase due to decreasing ice thickness that has covered large areas of land and water that have been inaccessible (CCA, 2014). Although this may lead to increased incomes for some Nunavummiut, further environmental challenges could impact food insecurity for future generations (Nunavut Climate Change Centre, 2017).

## **4.6. Legislation**

### **4.6.1. Hunting Quotas and Firearms Regulations**

Inuit food security is impacted by specific legislation. Hunting quotas imposed in 2002 (under the Federal Species at Risk Act) affect the ability to hunt animals that Inuit have been reliant on for centuries. The Federal Species at Risk Act lists 231 mammals, birds, reptiles, amphibians, fish, arthropods, and molluscs that are endangered, threatened, and of special concern. Among those most impacting food supply in Nunavut are caribou, bison, Atlantic salmon, and aurora trout (S.O., Phone Interview, March 13<sup>th</sup>, 2018). These quotas do not take into consideration specific communities throughout the territory, as some communities may be more reliant on certain species compared to others (Ferguson, 2016).

The Firearms Act enacted in 1995 limits access to hunting weapons. Although Indigenous peoples have greater access through the Aboriginal Peoples of Canada Adaptations Regulations, it is not uncommon for Nunavummiut to wait over two years to obtain a gun licence. These changes have significantly destabilized already food insecure regions, thus worsening the problem (Ferguson, 2016).

## **4.7. Population Growth**

Population growth poses unique challenges for food security, since higher population levels require additional food in the region. Nunavut's population is projected to increase from 37,083 to 48,042 by 2035 (Nunavut Bureau of Statistics, 2017). From 2011 to 2016, Nunavut experienced a 12.7% increase in its population. Statistics Canada suggests this increase is almost exclusively attributed to the high fertility rate, which was 2.9 in 2016 compared to the national average of 1.6 (Macleans, 2017). Migration has not substantially increased population levels, as net migration moved from negative to positive and back to a negative population out flow from 1996 to 2010.

(MacMahon, 2010). However, data is limited on other contributing factors influencing the increased population growth.<sup>4</sup>

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<sup>4</sup> It is important to note that 84% were identified as Inuit in 2016 (Nunavut Bureau of Statistics, 2017). Although data is lacking for 2016, there were 130 First Nations and 130 Metis Nunavummiut in 2011 (Statistics Canada, 2016).

## **Chapter 5. Existing Policies to Address Food Insecurity**

An extensive array of policy solutions has been implemented since the 1960s. There are no national policies explicitly addressing food insecurity, rather numerous Canadian wide social policies have been implemented that help those who are food insecure. For an in-depth description of each policy solution on the federal, territorial, and non-governmental level see “Appendix A: Existing Policies – Canada and Nunavut”.

The table below briefly lists the policies; the programs highlighted in red have been discontinued and the programs highlighted in green are still operating.<sup>5</sup> Currently, the most notable policy initiatives include Nutrition North Canada, the Country Foods Distribution Program, the Nunavut Harvester Support Program, and Growing North. These will be discussed in greater detail in Chapter 9 and 11.

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<sup>5</sup> It is important to note that publicly available information about current programs is often not updated online (A.M., Phone Interview, Jan 8<sup>th</sup>), meaning the status of programs could potentially be alternate than the information presented.

## 5.1. List of Policies

Table 1. Existing Policies to Address Food Insecurity

Federal:	Federal & Territorial:	Territorial:	Non-Governmental:
<p><b>Food Subsidy Programs:</b></p> <ul style="list-style-type: none"> <li>• Nutrition North Canada Subsidy Program (2011)</li> <li>• Food Mail Program (1960)</li> </ul> <p><b>Investment Programs:</b></p> <ul style="list-style-type: none"> <li>• Investments in Local Food Production (2012-2014)</li> </ul> <p><b>Climate Change Programs:</b></p> <ul style="list-style-type: none"> <li>• Climate Adaption Program (Discontinued 2016)</li> </ul>	<p><b>Educational Programs:</b></p> <ul style="list-style-type: none"> <li>• Health Canada's Food Guide for First Nations, Inuit and Métis (2007)</li> <li>• Canada Prenatal Nutrition Program (CPNP) – Indigenous (1995)</li> </ul> <p><b>Climate Change Programs:</b></p> <ul style="list-style-type: none"> <li>• Northern Contaminants Program (1991)</li> </ul>	<p><b>Local Food Harvesting:</b></p> <ul style="list-style-type: none"> <li>• Country Foods Distribution Program</li> <li>• Fuel Tax Rebate Program (2006)</li> <li>• Fisheries Development and Diversification Program (2002)</li> <li>• Fisheries Training Consortium (2005)</li> <li>• The Hunters' and Trappers' Disaster Compensation Program (2004)</li> <li>• Community Harvesters Assistance Program</li> <li>• Community Organized Hunts (1990)</li> </ul> <p><b>Poverty Reduction Plans:</b></p> <ul style="list-style-type: none"> <li>• Income Assistance</li> <li>• Makimaniq Plan 2 (2017)</li> <li>• Makimaniq Plan 1 (2011)</li> <li>• Nunavut's Food Security and Action Plan (2014-2016)</li> </ul>	<p><b>Local Food Harvesting:</b></p> <ul style="list-style-type: none"> <li>• Nunavut Harvester Support Program (1993-2014 → re-opened 2017)</li> <li>• Harvesters Hunt – Project Nunavut (2010-2013)</li> </ul> <p><b>Food Assistance Programs:</b></p> <ul style="list-style-type: none"> <li>• Growing North (2015)</li> <li>• School Breakfast Program (in some schools)</li> <li>• Igloolik Emergency Voucher Food Program (2015)</li> </ul>

# **Chapter 6. Community Perceptions on Traditional and Market Food**

Chan (2006) reports on the outcome of six focus groups conducted in 2004 in six different Nunavut communities by a steering committee that involved researchers from the Inuit National Organization, a manager of the Food Mail program, researchers from McGill University, and nutritionists from the federal and territorial governments. There were 46 participants that attended the focus groups, with ages ranging from 17 years old to over 60 years old. The goals of the focus groups were to better understand community perceptions regarding the availability and accessibility of traditional foods and market-based foods (Chan, 2006). These findings help situate the problem from a local perspective, thus better understanding culturally accepted ways in which this crisis can be addressed<sup>6</sup>.

## **6.1. Key Findings**

### **6.1.1. Barriers to Food Insecurity**

- All participants report difficulty obtaining food per month. Barriers that prevent access to food often include low income, the high costs of living, the high costs of hunting supplies, changing cultural practices and knowledge, and lack of government support. Changing diets, particularly among younger people, is reported as an influencer of reduced traditional food consumption.

### **6.1.2. Access to Traditional Food**

A strong emphasis on improving access to traditional food was discussed by participants for the following reasons:

- Traditional food is more affordable
- Traditional food provides a variety of health benefits
- The exchanging of food and hunting supplies strengthens communities
- Hunting for food passes on traditional knowledge and skills to younger generations

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<sup>6</sup> It is important to emphasize that the focus groups were conducted in 2006 and it is possible that community perceptions regarding the availability and accessibility of traditional food and market-based food may have changed. The use of the term “harvesting” does not refer to Growing North’s greenhouse initiative, as this program was not established until 2013. Additional updated stakeholder engagement and consultation is necessary to better understand relevant community perceptions.

### **6.1.3. Improving Food Insecurity**

Participants hold strong opinions regarding strategies to improve food security in Nunavut. The most common strategies include the following:

- Increased support for local harvesting programs
- Increased food subsidies
- Re-affirming cultural concepts of sharing and reciprocity
- Advocacy for healthy food choice promotion

# **Chapter 7. Stakeholders**

Numerous government and non-government organizations could be impacted by this complex topic area.

## **7.1. Federal Level**

On the federal level, this research provides recommendations that may improve the government's ability to effectively reduce food insecurity levels among populations they already serve. The following are potential federal departments that may be included as stakeholders:

- Indigenous and Northern Affairs Canada
- Health Canada
- Agriculture and Agri-Food Canada
- Environment and Climate Change Canada
- the Department of Finance Canada

## **7.2. Territorial Level**

- Ministry of Health
- Department of Economic Development and Transportation
- Ministry of Environment
- Ministry of Education
- Hunters and Trappers Organization

## **7.3. Non-Governmental Level**

On the non-governmental level, the following organizations and groups are considered, including:

- Nunavut Tunngavik Incorporated
- the Nunavut Wildlife Management Board
- Nunavut Food Security Coalition
- the Ilisaqsivik Society
- the Indigenous and Global Health Research Group
- Project Nunavut
- Growing North
- School Board Members
- Nutritionists

## **7.4. Other Stakeholders**

Other stakeholders taken into consideration are:

- Southern and Northern Food Suppliers
- Northern Retailers
- Nunavut Food Processing Facilities

## **Chapter 8. Methodology**

### **8.1. Research Questions**

This project uses a mixed-method research approach that uses a literature review, four descriptive jurisdictional scans, and thirteen in-depth semi-structured interviews. The interviews were conducted with a variety of experts working in the federal government, territorial government, and non-government organizations. The research findings help develop the policy options and recommendations.

This study addresses the following research questions:

- What extent are Nunavut residents exposed to food insecurity and what are its main drivers?
- What practices have been adopted in other jurisdictions to increase the local harvesting and commercialization of food?
- What policy solutions could help increase the local harvesting and commercialization of food and what are the barriers of doing so?

### **8.2. Jurisdictional Scans**

Jurisdictional scans are used to find practices that have been adopted in other jurisdictions to increase the local harvesting and commercialization of food. The first jurisdictional scan explores Greenland's Country Food Markets. The second jurisdictional scan explores Finland's School Meals Program. The third jurisdictional scan explores the Cree Hunters and Trappers Income Support Program in the Eeyou Istchee terry, Quebec. The fourth jurisdictional scan explores a successful arctic greenhouse program that is currently operating in Naujaat Nunavut (called Growing North).

### **8.3. Semi-Structured Interviews**

Thirteen expert semi-structured phone interviews were conducted with experts, stakeholders, and other parties with relevant experience to gather insight and help answer the research question “what policy solutions could help increase the local harvesting and commercialization of food and what are the barriers of doing so”.

Participants were contacted by email, interviews were conducted between November and March, interviews were recorded, and interviews lasted between 30 and 60 minutes. Questions were tailored to each interviewee, as all interviewees have been involved in Northern food security issues in different forms. As numerous interviewees requested to remain confidential, some interviewees are unidentifiable by name. Input from the expert interviews is important to weigh, compare, and evaluate the final policy options.

The semi-structured interviews are analysed using thematic analysis. The process of thematic analysis involves familiarization, searching for themes, reviewing themes, defining and naming themes, and report writing. It is important to note that themes may be broad, themes may miss nuanced data, flexibility makes it difficult to concentrate on specific aspects of the data, there is interpretive power, and alternative readings of the data may not be considered (Braun and Clark, 2006).

## **8.4. Methodological Limitations**

The subject of food insecurity in Nunavut is exceptionally complex in its history, drivers, impacts on health, and theoretical discourse. The limited methods used in this study cannot capture the full complexity, depth, and variety of these experiences. A lack research on specific populations creates barriers in fully assessing the issue, particularly research on individuals living on First Nations reserves or Crown Lands and the homeless (Proof, 8, 2014). Much of the health data is dated back to the early 2000s, meaning it is difficult to fully understand the current health status of Nunavummiut (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018). The wide array of previous and current policy initiatives, and the lack of rigorous evaluation of these initiatives, also create challenges in determining their effectiveness and predicted outcomes.

Connecting with Nunavut based government and non-government experts is challenging, given the small staff employed and regular turnover of employees. As a result, this research would benefit from further expert interviews. Additionally, the sensitivity of the subject, including solutions that could help solve food insecurity among Indigenous populations, is a barrier in identifying which policy recommendations could have the most impact. Due to research ethical reasons and given the rural and remoteness of many Nunavut communities, this research is not able to interview populations most impacted by food insecurity (particularly Indigenous populations). This

study is limited by the researcher's position as a non-Indigenous person working on this complex policy program from an urban setting without experience or connection to Indigenous communities. A critical element in the success of public programs is ensuring that stakeholders have an opportunity to provide input into the identification of needs, program objectives, and the effectiveness of delivery mechanisms (CDC, 2008). Therefore, more stakeholder interviews and local engagement (particularly among Indigenous Nunavummiut) needs to be conducted. It is critical to emphasize that findings and recommendations must be interpreted in this context. This study is also limited by the constraints of resources and time.

# **Chapter 9. Research Findings**

The following comprises the research findings of the jurisdictional scans and semi-structured interviews.

## **9.1. Jurisdictional Scans**

To assess potential policy changes that could occur in Nunavut, it is helpful to consider successful policies in other jurisdictions. In addition, analyzing a successful food security project that is currently operating in Nunavut helps to inform potential policy recommendations.

**Table 2. Jurisdictional Comparison**

Jurisdiction:	Hunting License:	Wildlife Regulatory Body:	Governing Autonomy:	Food Sale Options:	Population:	Ethnic Groups:	Economy:	Climate:
<b>Greenland</b>	Required	Ministry of Hunting, Fishing, and Agriculture (distributed by the municipality)	Autonomous constituent country within the Kingdom of Denmark, meaning regional autonomous governing authority <sup>7</sup> Member of European Union	Hunters sell to processing plants; private institutions; private household; CFM's	56,538 <sup>8</sup>	88% Greenland Inuit <sup>9</sup>	Fishing; Hunting; Whaling; Mining; Governance <sup>10</sup>	Arctic climate
<b>Nunavut</b>	Not Required - under the Nunavut Land Claim Agreement	Wildlife management regulated by the Nunavut Wildlife Management Board and HTO	Territory of Canada under the Lands Claims Agreement in 1993, meaning no inherent sovereignty other than federally appointed authority <sup>11</sup>	Hunters sell through social media (eg Facebook) and to local retailers	37,083 <sup>12</sup>	84% Nunavum miut Inuit <sup>13</sup>	Hunting; Fishing; Whaling; and Transportation <sup>14</sup>	Arctic climate

<sup>7</sup>(US Department of State, 2014)

<sup>8</sup>(Worldometers, 2018)

<sup>9</sup>(CIA, 2018)

<sup>10</sup>(CIA, 2018)

<sup>11</sup>(Government of Nunavut, 2017).

<sup>12</sup>(Nunavut Bureau of Statistics, 2017)

<sup>13</sup>(Nunavut Bureau of Statistics, 2017)

<sup>14</sup>(Government of Nunavut, 2010)

<b>Finland</b>	Required	Finnish Wildlife Agency; the National Wildlife Council	Parliamentary republic with representative democracy <sup>15</sup>	Commercial fishing and hunting	5,509,717 <sup>16</sup>	89% Finnish <sup>17</sup>	Energy; Transportation; Industry; Tourism	Arctic climate
<b>Quebec - Eeyou Istchee Territory</b>	Not Required	the Cree Hunters and Trappers Income Security Board	the Grand Council of the Cree - jointly governed by territory and province of Quebec	Harvesters sell to community members and Cree HTB	16,000 <sup>18</sup>	Cree First Nations	Hunting; Fishing; Trapping; and Transportation	Tundra in North; Boreal Forests in South

<sup>15</sup>(National Encyclopedia, 2018).

<sup>16</sup>(Statistics Finland, 2017)

<sup>17</sup>(World Atlas, 2018)

<sup>18</sup>(Cree Health, 2012).

### **9.1.1. Greenland**

Greenland is very comparable to Nunavut, including similar population size, climate, economy, ethnic groups, dietary preferences, high transportation costs, and high poverty levels (16% below the poverty line in 2015). Similar to Nunavut, Greenland is subject to the growing threats climate change poses on food insecurity. Despite Greenland's harsh weather conditions and sparsely located communities, food insecurity levels remain exceptionally low. Goldhar (2010) finds that only 8.2% of residents are identified as food insecure. For children and people below age 35, food insecurity levels are virtually zero. For elders over age 55, only 15% are reported as marginally food insecure and none are reported as severely food insecure (Goldhar, 2010). Nonetheless, it is important to emphasize that communities in Greenland are far more accessible and Greenland's geography allows for more access points for cargo ships; this contributes to more easily delivering food and developing reliable infrastructure for food production, processing, and selling compared to Nunavut (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). Unlike Nunavut, Greenland's food factories and processing sector is far more developed (Greenland has 48 facilities and Nunavut has 3). Additionally, Greenland's political structure is very different compared to Nunavut, as Greenland is an autonomous constituent country within the Kingdom of Denmark and Nunavut is a territory of Canada. As such, Greenland holds administrative jurisdiction over a defined geographical region and is a form of regional government (US Department of State, 2014), where Nunavut has no inherent sovereignty besides authority provided by the federal government (Government of Nunavut, 2017).

#### **9.1.1.1      Country Food Markets (CFM)**

Greenland's success is largely attributed to the establishment of Country Food Markets (traditionally referred to as "Kalaaliminerniarfíit"). CFM's are found in most communities and often operate in the form of outdoor kiosks where hunters sell country food at fixed prices agreed upon by the local Hunters and Fisher's Association to ensure prices for meat products remain low. In 2016, roughly 2,500 professional hunters sold their catch to CFM's (Ford, 2016). As a result of CFM's, culturally valued country food is widely available in Greenland and job growth has increased among Indigenous populations due to continuous employment opportunities in the sector. The commercialization of country food has also resulted in costs being lower than imported

food, meaning there is less reliance on imports and government food subsidy programs (Goldhar, 2010). Ford (2016) emphasizes that CFM's have directly increased local hunting promotion, supported local economies, and provided access to financial resources which helps compensate for the high costs of harvesting equipment (such as boats, all-terrain vehicles, rifles, ammunition, gasoline, safety equipment, and maintenance). Although the sale of country food has a long history in Greenland (including sales to processing plants, local institutions, and directly to households), CFM's have been identified as the main reasoning behind low food insecurity levels (Gillies, 2016). CFM's are greatly supported among Greenlanders due to purchasing options catering to households without an active hunter, market hours being reliable, locations being easily accessible, and facilities being perceived as more hygienic than other food markets (Ford, 2016). Additionally, most Greenlandic Inuit do not feel CFMs have negatively impacted sharing networks (Gillies, 2016). For Nunavut, Gillies (2016) emphasizes that CFM's have relevance and applicability due to CFM's performing highly successful and due to many similarities between Greenland and Nunavut.

### **9.1.2. Finland**

Similar to Nunavut, Finland has a comparable climate, similar dietary preferences, and many geographically dispersed and remote communities. Despite Finland's isolated communities and arctic weather conditions, Finland ranked among the lowest food insecure countries in 2017 (ranking 14<sup>th</sup> on the food insecurity index and receiving an 81% score) (Food Insecurity Index, 2017). However, Finland's transportation sector (including the country's extensive road system, icebreaker cargo ships, and rail transportation) is far more advanced compared to Nunavut; allowing for food to be more easily distributed to remote communities (Smith, 2017). Finland food factories and processing sector is more developed, and Finland had the second lowest poverty rate in the world in 2013 (UNICEF, 2013). Finland's political structure is also dissimilar compared to Nunavut, as Finland is part of the European Union and the country is a parliamentary republic with a representative democracy (National Encyclopedia, 2018).

### **9.1.2.1      *School Meals Program***

Despite other contributing factors, Finland's free School Meals Program has contributed to low food insecurity levels (CCA, 2014). In 1948, Finland was the first country in the world to implement free school meals. The federal Basic Education Act (implemented in 1998) sets the administrative rules, technical guidelines, and regulatory standards for this policy; including requiring that one third of daily food intake must be provided to all students free of charge every school day (National Center on Education and the Economy, 2010). The program guidelines are overseen by the National Nutrition Council and municipalities operate and manage the program on the local level (National Center on Education and the Economy, 2010). Funded through the Finnish National Board of Education, the program costs roughly CAN\$2.66 to CAN\$13.18 a day per student; accounting for roughly 8% of all education costs (YLE, 2017).

### **9.1.3. Quebec - Eeyou Istchee Territory**

Eeyou Istchee is a territory of Quebec (similar to a regional municipality) represented by the Grand Council of the Crees (the largest First Nations group in North America). Eeyou Istchee regional government was established in 2012 and the territory holds a population of 16,000 (Cree Health, 2012). Similar to Nunavut, the territory's nine communities are remote, isolated, and geographically dispersed. The climate ranges from tundra in the north to boreal forests in the south (Cree Health, 2012). Although food insecurity levels remain high in Eeyou Istchee (as more than one quarter or 27% of the adult population experienced food insecurity in 2002), policies implemented in the territory could prove relevant for Nunavut (Duquette, 2013).

#### **9.1.3.1      *the Cree Hunters and Trappers Income Support Program***

Implemented in 1975 as part of the James Bay Northern Quebec Agreement (JBNQA), the Cree Hunters and Trappers Income Support Program provides an annual income guarantee to Crees harvesters that spend a significant portion of time on the land (CHTISB, 2018). Harvesting activities include hunting, fishing, trapping, equipment repair or manufacture, trap line preparation, and processing and transporting country food (Tunngavik, 2008). By guaranteeing a basic income, Cree are incentivised to pursue harvesting as a livelihood, which helps support traditional ways of life and guarantees enough food supply is available for community needs (CHTISB, 2018). The Cree

Hunters and Trappers Income Security Board (which consists of three appointed Cree representatives and three members of the government of Quebec) sets the administrative rules, technical guidelines, and regulatory standards for this policy. Local authorities are responsible for operating and managing the program, including interviewing applicants and distributing payments to eligible harvesters (Tunngavik, 2008). Eligibility under this program considers the harvesting activities of other family members, the distance between communities and harvesting regions, illness, the pursuit of education while continuing to harvest, and the total number of days spent harvesting per individual annually. To receive full benefits, at least 120 days a year must consist of traditional activities and time spent harvesting must be more than time spent on other forms of employment (CHTISB, 2018). In 2003, benefits under the program totaled \$15,897,360, of which 92% was paid to harvesters for days spent on the land. Most recipients received between \$6,000 to \$12,000 (Tunngavik, 2008). Approximately 38% of the Cree working population (or one quarter of the total population) is enrolled in the program (Clinton, 2002).

#### **9.1.4. Nunavut**

##### **9.1.4.1      *School-Based Greenhouse Initiative***

A school-based greenhouse initiative has proven successful in Nunavut. Originating as a Ryerson University student pilot project in 2015, Growing North built an arctic greenhouse in the 1,082-person town of Naujaat Nunavut. Unlike ordinary greenhouses, Growing North combines three different technologies into one working unit that operates all year round, withstanding wind speeds up to 180 km per hour and 7 feet of direct snow. The greenhouse has a polycarbonate exterior (16 feet in height and 42 feet in diameter), solar powered air system, and thermal mass storage that can maintain temperatures 30 degrees warmer than the outside climate and without sunlight. Since there is only one hour of sunlight per day in some winter months, Growing North designed a dual-purpose unit that generates both electricity and heat; a breakthrough for arctic greenhouse development. The greenhouse also uses vertical hydroponic towers and hybrid raised dirt beds to grow produce, which allows for growing three times the amount of food and uses 20 times less water than traditional greenhouses. If materials

are obtained from southern suppliers, building one arctic greenhouse costs roughly \$125,000 (translating to \$70.86 per square foot) and takes around one week to completely construct (Canning, Phone Interview, December 1, 2017). Per year, one arctic greenhouse (16 feet in height and 42 feet in diameter) growing year-round produces over thirteen thousand pounds of produce (translating to 7.36 pounds of produce per square foot). This meets the daily recommended amount of nutrient intake per day necessary for the maintenance of good health for 614 people (Canning, Phone Interview, December 1, 2017).

The project continues to be a major success, as half of the 1,082-person community is able to eat fresh vegetables every day, excess produce is distributed into the local community, and a co-op education course taught through the local high-school offers students school credits for volunteering in the greenhouse<sup>19</sup>. Growing North helps students learn about nutrition, improves their chances of graduating, and ensures students nutritional needs are adequately met (Growing North, 2017). Although dependent on the type of fruit and vegetable, a full growth turn-over has shown to be relatively fast. For instance, leafy greens (such as lettuce, kale, swish chard, and cabbage), potatoes, and carrots take between 65 to 75 days (Canning, Phone Interview, December 1, 2017).

## 9.2. Interview Results

As noted above, semi-structured phone interviews were conducted with experts, stakeholders, and other parties with relevant experience to gather insight and to inform the policy options. As numerous interviewees requested to remain confidential, some interviewees are unidentifiable by name. Those listed below are the ones who agreed to be identified.

The following individuals were interviewed:

- Shylah Elliot, Health Policy Analyst, Nunavut Tunngavik Incorporated
- Ben Canning, Co-Founder and President, Growing North

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<sup>19</sup> The high-school where the greenhouse is located had 140 students and 13 staff members in 2016 (NTIP, 2016).

- Will Hyndman, Project Manager, Department of Economic Development and Transportation, Government of Nunavut
- A.M., Territorial Nutritionist, Department of Health, Government of Nunavut
- Karen Von Jagow, Board Chair, DueNORTH Canada
- Barry Prentice, Professor, Department of Supply Chain Management, I.H. Aspen School of Business, University of Manitoba
- Priscilla Settee, Professor, Department of Indigenous Studies, University of Saskatchewan
- S.O., Director, Centre for Biodiversity Research; Professor, Department of Zoology, University of British Columbia
- David Natcher, Professor, Department of Agricultural and Resource Economics, University of Saskatchewan; Senior Research Fellow, Global Institute for Food Security; Professor, Department of Bioresource Policy, Business and Economics, University of Saskatchewan
- Peter Harrison, Professor Emeritus, School of Policy Studies, Queens University
- Birgitta Evengard, Professor, Senior Consultant and Chair of the Division of Infectious Diseases at Umeå University; Chair of the Board of the Arctic Research Centre
- Shirley Thompson, Associate Professor, Natural Resources Institute, University of Manitoba
- Cecilia Rocha, Director and Professor, School of Nutrition, Ryerson University

The following are key themes and insights drawn from the interviews.

### **9.2.1. Drivers of Food Insecurity**

- All interviewees identified the drivers of food insecurity found in the literature. These included the impacts of colonization, the high costs of transporting foods, the territory's unique geography, challenges posed by climate change, debilitating policy and legislation on traditional hunting practices, and developing difficulties due to population growth.
- Despite other identified drivers, severe poverty is considered the number one driver of food insecurity in the territory, followed by the inaccessibility of remote communities.
- The growing threats of climate change on food insecurity was emphasized in all interviews, particularly the impact climate change has on melting ice (making hunting seasons shorter), changing animal migratory routes, declining wildlife, and unpredictable weather patterns.
- Several interviewees emphasized that food insecurity has always been a challenge in the north and its drivers are constantly changing due to a variety of reasons. Interviewees appeared to be pessimistic that there is a single solution that will fully resolve this issue.
- Interviewees suggested that the number of people who are identified as food insecure may be underrepresented, since those that are marginalized (including Indigenous populations and those with low socioeconomic status) may not have participated in territorial surveys and the framing of survey questions could have skewed results.

### **9.2.2. Policies**

- Many interviewees emphasized that the NNC program has greatly failed to address food insecurity and the program requires urgent re-evaluation. A federal food security policy, that specifically decreases the price of food sold by retailers in Nunavut, is recommended.
- Several interviewees suggested increasing education on healthy eating and nutrition in general as a starting point.
- Interviewees suggested that the mark up of food in the territory significantly benefits retailers. As a solution, implementing sustainable territorial solutions and cutting out retailers is proposed.
- Interviewees accentuated the importance of developing food systems for local hunters, since this would create a viable food system for communities to feed themselves and a robust food trade system in general.
- Developing the waged based economy in communities was highlighted.
- Interviewees emphasized the importance of expanding and improving existing transportation systems to ensure food and other essential items are deliverable to all northern communities.
- The level of funding and support for existing programs was highlighted. Interviewees suggest that federal and territorial funding should increase for programs that support the local harvesting of food.
- Economic opportunities in government, particularly in Iqaluit, continue to increase. As such, policies that help support and expand the territorial government are encouraged.
- Interviewees emphasized exploring innovative technologies to help solve this issue, including arctic greenhouses. However, interviewees suggested that this solution would need to be accompanied by additional policies that support local hunters to ensure enough nutritious food is available.

### **9.2.3. Other Considerations**

- Interviewees emphasized that additional research is needed, particularly more stakeholder engagement (especially among Indigenous populations) prior to the implementation of policies.
- Interviewees emphasized the importance of food sharing within Indigenous communities. As such, future policy initiatives need to strongly consider the cultural impact that may occur.

- Interviewees accentuated the importance of including northern community members in the policy making process.
- Further research regarding the health status of Nunavummiut is suggested due to significant portions of data being dated back to the early 2000s.

# **Chapter 10. Policy Options**

## **10.1. Improving the Nunavut Harvester Support Program**

A review of the Nunavut Harvester Support Program was conducted in 2002 by an interdepartmental working group which included extensive consultations with Inuit harvesters and communities, interviews with 125 stakeholders (including the Hunters and Trappers Organization, Nunavut Tunngavik Incorporated, the Regional Wildlife Organization, and the Government of Nunavut), and decisions were held in eight communities to discuss program gaps related to harvesters needs (Tunngavik, 2008). The NHSP provides financial assistance to eligible harvesters for harvesting activities through five different programs, including the Capital Equipment Program, the Small Equipment Program, the Women's Role in Harvesting Program, the Traditional Knowledge Enhancement Program, and the Community Harvest Program<sup>20</sup>. Funded by Nunavut Tunngavik and the government of Nunavut, the annual budget for the NHSP is roughly \$2,877,000; with an additional \$500,000 (15%) allocated for administration (Tunngavik, 2008). The NHSP Department within Nunavut Tunngavik is responsible for overseeing the administration and implementation of programs offered through the NHSP.

The NHSP has undergone substantial changes following implementation in 1993, including being discontinued from 2014 to 2017 due to the lack of program effectiveness and other contributing factors. Despite the NHSP being relaunched in 2017, an expert interviewee explains that the NHSP requires further program development and evaluation to ensure the needs of harvesters are being adequately met (Elliot, Phone Interview, Dec. 13<sup>th</sup>, 2017). Nunavut Tunngavik (2008, p.23) supports this by explaining that “despite the extensive nature of the review exercise a draft policy on harvester support programs never proceeded to the final phase...due to the need to develop partnerships with other organizations and departments in order to effectively meet the identified needs”. Nonetheless, the initial review identified numerous gaps existent in the

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<sup>20</sup> It is important to note that publicly available information about current programs is often not updated or publicly accessible online (A.M., Phone Interview, Jan 8<sup>th</sup>), meaning programs offered under the NHSP and current budgetary information may be different from the information presented.

program, and identified some needs of harvesters that must to be addressed. Tunngavik (2008) briefly lists the gaps, including the lack of:

- Operational funding
- Partnerships and collaboration between government departments, agencies, and other stakeholders
- Decision-making involving of the Hunters and Trappers Organization on the local level
- Program integration and consistency
- Program utilization (addressing only one-third of demand) due to poor promotion and administrative barriers
- Support for full-time hunters
- Harvesting training techniques (specifically among youth)
- Assistance and benefits to Nunavut Inuit households that are unable to financially afford necessary equipment for a traditional lifestyle
- Support for resource development programs in communities

The following offers a combined policy solution consisting of four integrated programs that could be implemented under the NHSP to help improve and address some of the barriers existent in current programs. This would further support the local harvesting and commercialization of food in Nunavut. Since programs within this option are not mutually exclusive, a combination of them as one solution is the recommended approach.

### **10.1.1. Program 1: Country Food Market**

Obtaining country foods, particularly in remote communities, has been identified as a challenge for those without an active hunter in the household, those who are not a part of close-knit food sharing communities, and those who are unable to access or afford hunting equipment (including skidoos, boats, gas, and other supplies) (Egeland, 2010). In addition, Nunavut lacks sufficient market infrastructure and government support for the selling and purchasing of local food (Project Nunavut, 2017). For instance, territorial regulations restrict food retailers from selling country food unless stores contain separate freezers for both southern food and local country food; this ultimately deters retailers from selling country food due to the significant costs associated with purchasing, installing, and maintaining separate freezers (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). As a solution, Country Food Markets could be

implemented, managed, and regulated throughout the territory. This would increase access to and the availability of nutritious and culturally valued food for consumption, as emphasized in an expert interview (Settee, Phone Interview, March 12<sup>th</sup>, 2018).

If implemented, this policy would require establishing food markets throughout Nunavut's communities if capacity is deemed achievable. Similar to Greenland, most communities would only require one CFM due to small populations, however the design and operation of CFMs should be developed based on each community's size, needs, and distinctiveness (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). This policy would benefit from building community freezers that store food year-round during hunting off-season in communities that do not already have storage facilities (currently 10 out of Nunavut's 25 communities do not have community freezers). Since each community in Nunavut has its own independent electricity generation and distribution system, all 25 communities would be able to install a community freezer (Nunavut Energy, 2016). Many existing programs (such as the Country Foods Distribution Program) provide over \$30,000 in annual funding to eligible communities for investments in infrastructure such as community freezers, meaning costs for new storage facilities would not be substantial for this program (DEDT, 15, 2016).

CFMs are not unfamiliar in Nunavut. In 2010, Project Nunavut launched the first CFM in the territory and it was exceptionally successful. Project Nunavut (2017, p.1) explains that the "markets were raucous affairs. Customers would show up hours before the official start time and when hunters rolled in with truck loads full of country food it would be gone in a flash". The markets demonstrated there is strong demand for country food and hunters are willing to supply food products (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). Due to Project Nunavut being a non-profit organization and programs often operating off donated money, the organization was unable to individually provide the resources and support needed to continue and expand the markets. As a result, the markets ended in 2013 (Project Nunavut, 2017). For those not a part of close-knit food sharing network, Nunavummiut are now turning to social media to sell and purchase country food (S.O., Phone Interview, March 13<sup>th</sup>, 2018). In 2013, thousands of pounds of country food were sold between numerous Nunavut communities from social media food sales (Project Nunavut, 2017). These sale options have been criticized for not providing enough access points to purchase country food (S.O., Phone Interview, March 13<sup>th</sup>, 2018). An expert interviewee strongly recommends that governments help fund,

establish, manage, evaluate, and regulate CFMs within the territory (Hyndman, Phone Interview, Dec.12, 2017).

Since Nunavut is very similar to Greenland, this type of program could prove beneficial (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). In Greenland, CFM's successfully reduced food insecurity by establishing an effective market place to sell food (which supports the harvesting sector and harvester's income), by increasing access points to purchase food for vulnerable populations, and by ensuring food prices remain low for consumers (Goldhar, 2010). Despite a nutrition transition from country food to market food in both Nunavut and Greenland, traditional food remains tied to cultural identity, cultural stability, and community solidarity (CCA, 2014). MacDonald (2016) supports this by explaining that traditional food sharing remains an important element of social networking and relationship building among Inuit communities.

### **10.1.2. Program 2: Food Acquisition Program**

The lack of income support for local harvesters and inadequate government support for current territorial meals programs has been identified as a barrier to reduce food insecurity (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018). As a solution, a Food Acquisition Program could be implemented, managed, and regulated in the territory. This policy would directly purchase food from local markets (such as Country Food Markets) and distribute food as part of a territorial School Meals Program. Considering the lack of employment opportunities for harvesters and marketplaces to sell food, this policy would guarantee a source of income for harvesters, resulting in hunting being a viable livelihood option and enabling harvesters to hunt full-time (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). Additionally, this policy would increase the amount of nutritious country food consumed in schools, thus supporting the distribution of local food to vulnerable populations and supporting traditional diets and eating preferences (Harrison, Phone Interview, March 15<sup>th</sup>, 2018).

The government of Nunavut and other non-government organizations already recognize the importance of supporting locally harvested food by funding a variety of different programs, most notably the Country Foods Distribution Program and the

Fisheries Development and Diversification Program (Government of Nunavut, 2016). The successful implementation and administration of these programs provides strong indication that a Food Acquisition Program is achievable in Nunavut (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018).

### **10.1.3. Program 3: School Meals Program**

Currently, breakfast meal programs are offered in numerous public schools throughout the territory. Although these breakfast programs help address food insecurity, there are no federal or territorial regulatory standards for meals, programs operate off donated money, food is primarily sourced from southern suppliers, and programs are community initiated and community driven (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018). This often results in food quality being poor, fruits and vegetables not being provided, high costs associated with transporting food, programs being operated by teacher or student volunteers, and a deficiency of regular staff (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). As a solution, an enhanced School Meals Program could be implemented; requiring that all public educational institutions provide at least two meals and a snack (fulfilling a certain percentage of daily nutritional intake) to students per day in the territory schooling network (including kindergarten, elementary school, middle-school, high-school, and education centres for young adults). Since food provided through current breakfast programs is often the only meal many children consume per day, a properly regulated and operated School Meals Program could significantly reduce food insecurity levels in Nunavut (Jagow, Phone Interview, March 5<sup>th</sup>, 2018).

This program requires that a significant portion of food must be purchased from local suppliers, thus helping support local harvesters and better developing local food networks (Harrison, Phone Interview, March 15<sup>th</sup>, 2018). This would be accomplished by primarily sourcing country food through the Food Acquisition Program, along with fresh fruits and vegetables from the school-based greenhouse initiative (program four). To ensure there is enough local food supply for schools and the community, harvesters would need to hunt full-time during optimal hunting seasons and store food year-round in community freezers for hunting off-season. Further research needs to be conducted to determine the precise percentage requirements for both food purchased through the

Food Acquisition Program and the amount of daily nutritional intake provided to student per day.

#### **10.1.4. Program 4: School-Based Greenhouse Initiative**

Many Nunavut residents lack access to fresh fruits and vegetables, often due to the inaccessibility of remote communities (Ferguson, 2016). The lack of access poses great threats to the health of community residents, including Inuit children who are at high risk of nutrition deficiency (Tarasuk, 2013). Existing policies aimed at reducing food insecurity in Nunavut often lack solutions at the local level, particularly in public and community schools. Sidaner (2012) emphasizes that schools are an important and emerging arena for development initiatives linking access to adequate and healthy food, the promotion of small food producers, and the promotion of health and nutrition education (Sidaner, 2012). As a potential solution, a school-based arctic greenhouse initiative could be implemented in schools throughout Nunavut's territory schooling network where capacity is deemed achievable. This would significantly increase access to and the availability of nutritious food for consumption since fruits and vegetables would be used for consumption as part of a School Meals Program (Natcher, Phone Interview, March 14<sup>th</sup>, 2018).

Similar to the arctic greenhouse currently operating in Naujaat, all excess produce could be donated to the local community through existing social programs. In addition, a nutrition course for school credits could be offered to students, which includes a teaching component about the foundations of nutrition and an interactive component where students help plant and grow produce (Canning, Phone Interview, December 1<sup>st</sup>, 2017).

The successful implementation and current operation of Growing North's hydroponic arctic greenhouse in the town of Naujaat indicates that this policy merits consideration. As mentioned, all public students and half of the 1,082-person community in Naujaat are now able to eat fresh fruits and vegetables every day, a co-op education course taught through the local high-school has improved student graduation rates, and food consumed in schools has ensured a large portion of nutritional needs for students

are adequately met (Canning, Phone Interview, December 1, 2017). Projections from Growth North suggest that one arctic greenhouse (16 feet in height and 42 feet in diameter) growing year-round would produce over thirteen thousand pounds of produce per year. This translated to meeting the nutritional requirements on a yearly basis for 614 people (Canning, Phone Interview, December 1, 2017). Since Nunavut's total population reached 37,082 in 2016, and there are 43 public schools in 25 communities throughout the territory which provide formal education from kindergarten to grade 12, one arctic greenhouse in each school could potentially feed 71% of Nunavut's population with fresh fruits and vegetables everyday (Nunavut Bureau of Statistics, 2017). Despite many schools being small, and younger children in kindergarten or elementary school being unable to participate in harvesting, Growing North predicts that each school throughout the territory would be able to operate an arctic greenhouse if two extra staff were employed by each school (Canning, Phone Interview, December 1, 2017). However, there remains uncertainty around whether there is sufficient knowledge about and skills for greenhouse operation and maintenance in the long-term. Further research needs to be conducted to determine which schools have the capacity to operate this program and the number of additional staff that would need to be trained and employed. An expert interview suggests that local community members be trained and employed at the greenhouses, thus helping educate, harvest, and share food together with children and youth (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

# **Chapter 11. Evaluation Framework**

This section provides an explanation of the analytical framework used to evaluate each program under the combined policy solution. Despite differences among each program, assessment by the same criteria and measures helps to evaluate trade-offs and limitations. This process plays a critical role in informing the policy recommendations.

## **11.1. Effectiveness**

This criterion assesses the relative impact a policy could have on reducing the existing levels of food insecurity in Nunavut. This can be challenging given the influence of socio-economic factors. Thus, it is difficult to assess the impact of one policy. Analysis of a policy's potential effectiveness will consider the extent to which a policy could address some of the drivers of food insecurity and the barriers existent in current food insecurity programs.

There are various ways in which a policy could effectively reduce food insecurity levels. The first effectiveness criterion assesses the degree to which each option improves access to and the availability of nutritious food, particularly among Indigenous communities, children, and those identified as severely food insecure. This criterion is measured by the predicted amounts of nutritious foods available to Nunavummiut daily.

The second effectiveness criterion assesses the levels of supports offered to local harvesters. Effective policies would provide significant and innovative supports to all hunters, fishers, and other producers. This criterion is measured by assessing the predicted level of impact on local harvester's income.

The third effectiveness criterion assesses the degree to which each option keeps with traditional food sharing practices. MacDonald (2016) explains that traditional food sharing remains an important element of social networking and relationship building among Inuit communities. This criterion is measured by assessing the predicted level of impact on traditional food sharing practices.

A policy that received a “low” ranking is predicted to have a small impact on reducing food insecurity levels compared to other policies, a “medium” ranking is expected to have a moderate impact, and a “high” ranking is predicted to have a significant impact. Assessment is based on expert interviews, literature, evidence from other jurisdictions, and theoretical considerations.

## **11.2. Budgetary Costs to Government**

Determining specific cost predictions is challenging and not feasible for this research, however, providing a high-level estimate of the financial resources that may be required by the federal and territorial governments to implement each option helps to provide context for the potential impact on government revenues. Projections are based on the experiences of other jurisdictions, theoretical considerations, and current data available about the Nunavut context. Cost estimates are summarized in “Table Three: Summary of Evaluation of Policy Options” and “Table Four: Total Budgetary Costs”.

## **11.3. Ease of Implementation and Administration**

This criterion assesses the level of administrative complexity required to implement and administer each policy option. This is assessed through the number of government departments (federal and territorial) and non-government organizations required to manage each policy, and the number of regulations needed. It is important to assess ease of implementation and administrative complexity in consideration of procedural barriers that may result in long delays or the obstruction of plans. This criterion is assessed through opinion (particularly expert interviews) and is based on the experiences of other jurisdictions.

A policy receiving a “low” ranking is predicted to be very difficult or complex, a “medium” ranking is predicted to be moderately complex, and a “high” ranking is predicted to be easy to implement and administer.

## **11.4. Stakeholder Acceptance**

This criterion assesses the expected level of acceptance or resistance from stakeholders under each policy option. Given the complexity of the problem, relevant

stakeholders for each policy option may be different. This criterion is measured based on the estimated degree of support from the federal government, territorial government, non-government organizations, and among all Nunavummiut for each policy. The literature review and expert interviews help determine the degrees of support.

A policy receiving a “low” ranking predicts there would be significant opposition among stakeholders, a “medium” ranking predicts there would be moderate levels of opposition, and a “high” ranking predicts there would be minimal opposition from stakeholders.

## **Chapter 12. Evaluation of Policy Options**

This section evaluates the combined policy solution consisting of four integrated programs that could be implemented under the NHSP, according to the criteria previously outlined. The Food Acquisition Program and the School Meals Program have been combined in “Table Three: Summary of Evaluation of Policy Options”, since the FAP is a critical component of the School Meals Program and both programs received equal evaluation rankings. All four programs have been assessed as potential short-term solutions, which address some of the drivers of food insecurity in Nunavut. Additional long-term solutions are necessary.

**Table 3. Summary of Evaluation of Policy Options**

Objectives:	Program 1: <i>CFMs</i>	Program 2 & 3: <i>Food Acquisition Program and School Meals Program</i>	Program 4: <i>Arctic Greenhouses</i>
<b>Effectiveness:</b> <i>1<sup>st</sup> Criterion: Increased Access and Availability of Nutritious Food</i>	High	High	High
<b>Effectiveness:</b> <i>2<sup>nd</sup> Criterion: Improved Incomes of Harvesters</i>	High	High	Low
<b>Effectiveness:</b> <i>3<sup>rd</sup> Criterion: Impact on Traditional Food Sharing Practices</i>	Medium	High	Low
<b>Budgetary Costs to Government</b>	<b>Capital Costs:</b> -\$1.8m - \$7.3m per enclosed CFM -\$2.5k - \$20k per outdoor CFM  <b>Operational Costs:</b> -\$5k per outdoor CFM -\$25k per enclosed CFM	<b>Capital Costs:</b> -0  <b>Operational Costs:</b> -\$340k per school	<b>Capital Costs:</b> -\$125k per greenhouse  <b>Operational Costs:</b> -\$62k per greenhouse
<b>Ease of Implementation and Administration</b>	Low	Low	Low
<b>Stakeholder Acceptance</b>	Medium	Medium	Medium

## **12.1. Effectiveness**

All four programs are predicted to effectively increase the amount of daily nutritious food available to Nunavummiut, thus all programs received a “high” ranking for the first criterion. For the second criterion, all programs (besides program four) are predicted to positively impact the incomes of local harvesters. For the third criterion, all programs (besides program four) are predicted to keep with traditional food sharing practices, with the food acquisition and school meals ranking the strongest.

### **12.1.1. Program 1: Country Food Markets**

#### **12.1.1.1     *First Criterion: Increase Access and Availability of Nutritious Food***

As shown in Greenland, CFM’s continue to increase access to and the availability of traditional food, and food insecurity levels remain exceptionally low (Goldhar, 2010). Since Nunavut is very similar to Greenland, it is predicted that this program would produce similar results (Hyndman, Phone Interview, Dec.12, 2018). An expert interview with the Department of Economic Development and Transportation supports this by emphasizing that CFM’s could increase access to and the availability of country food throughout the territory (Hyndman, Phone Interview, Dec.12, 2017). The distribution of benefits and privileges within this program would be equally accessible and this program would not be subject to discrimination, since all Nunavummiut would have equal rights and access to markets. As such, this criterion ranks “high”.

#### **12.1.1.2     *Second Criterion: Expected Impact on Local Harvesters Incomes***

This program is expected to provide significant supports to local harvesters, thus this criterion ranks “high”. In Greenland, for instance, full-time professional harvesters selling food to CFM’s represented around 7% of the total workforce (CCA, 2014) and income generated from CFM sales was greater than food sales to private households, local institutions, and government processing plants (Marquardt, 1996). Considering Nunavut’s primary economic activities consisted of hunting, fishing, whaling, and transportation in 2010 (Government of Nunavut, 2010), it is likely that a significant number of harvesters would participate in this program (Settee, Phone Interview, March 12<sup>th</sup>, 2018). Additionally, the success of previous CFM’s in Nunavut (operating from 2011

to 2013 through Project Nunavut) indicate that this policy option would be successful and prove equitable if sufficient government supports were established (Hyndman, Phone Interview, Dec.12, 2017).

#### **12.1.1.3      *Third Criterion: Expected Impact on Traditional Sharing Practices***

MacDonald (2012) explains there is a developing consensus around whether CFMs would contribute to a better outcome. Although social stigma surrounding the sale of country food continues to soften, Ford (2016) finds there have been fundamental concerns about how the development of CFMs could undermine sharing networks and cultural identities. Within belief systems common to Inuit, harvesting and sharing food is often viewed as a gift from nature, thus food belongs to the people and does not have a cash value (Ford, 2016). As such, this program would need to be sensitive to the cultural impacts that could occur, including further destabilizing food insecure regions due to vulnerable populations diverting away from CFM sharing networks (Ford, 2016). This criterion ranks “medium” due to the uncertain impact this program could have on traditional sharing practices.

### **12.1.2.      Program 2: Food Acquisition Program**

#### **12.1.2.1      *First Criterion: Increased Access and Availability of Nutritious Food***

A Food Acquisition Program would increase access to nutritious foods for vulnerable populations, since food purchased from local markets would be distributed to School Meals Programs throughout the territory (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). However, a Food Acquisition Program would not increase access to daily nutritious foods for all Nunavummiut, including those not attending school where food is distributed. There may also be logistical issues related to distributing food across Nunavut’s unique landscapes, potentially resulting in food not reaching targeted programs and populations (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018). Nonetheless, this criterion ranks “high” considering the predicted impact this program would have on reducing food insecurity levels among vulnerable populations.

#### **12.1.2.2      *Second Criterion: Expected Impact on Local Harvesters Incomes***

This program would positively impact local harvesters since food would be purchased from local markets (Harrison, Phone Interview, March 15<sup>th</sup>, 2018). Hunting would thus be better supported by guaranteeing a source of income for hunters and by establishing effective food sharing networks (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). Since it is unknown how much harvester's incomes will increase, this program would benefit from tracking its impact on incomes. This could potentially increase program participation levels among harvesters in the long-term.

#### **12.1.2.3      *Third Criterion: Expected Impact on Traditional Sharing Practices***

Considering breakfast meal programs are currently offered in numerous public schools throughout the territory (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018), it is predicted that this program would support traditional food sharing practices. Although this criterion ranks "high", further stakeholder consultation is needed to determine whether Nunavummiut would be in favour of this type of program (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018).

### **12.1.3.      Program 3: School Meals Program**

#### **12.1.3.1      *First Criterion: Increase Access and Availability of Nutritious Food***

A School Meals Program would increase access to and the availability of nutritious food for students attending public schools in the territory, thus this criterion ranks "high" (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018). Access to the program would not be subject to discrimination or unequal distribution, since all students attending public schools would be equally eligible. Nonetheless, children who are home schooled would not have access to this program. Since "information on home schooling in Nunavut is not available online" (Martel, 2014, p.1), it is challenging to determine how many Nunavummiut would not have access.

#### **12.1.3.2      *Second Criterion: Expected Impact on Local Harvesters Incomes***

This program would positively impact local harvesters since a large portion of the food for the program would be purchased from local markets through the Food Acquisition Program (Harrison, Phone Interview, March 15<sup>th</sup>, 2018). As such, this option would positively impact the income of local harvesters throughout the territory (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

#### **12.1.3.3      *Third Criterion: Expected Impact on Traditional Sharing Practices***

Similar to program two, considering breakfast meal programs are currently offered in numerous public schools throughout the territory (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018), it is predicted that this program would support traditional sharing practices. However, if food from the greenhouse initiative was distributed as part of school meals it is possible that food preferences among specific groups and individuals may not align with this policy. Although this criterion ranks “high”, further stakeholder consultation is needed to determine whether Nunavummiut would be in favour of consuming a green-based diet and country food as part of a School Meals Program (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018).

### **12.1.4.      Program 4: School-Based Greenhouse Initiative**

#### **12.1.4.1      *First Criterion: Increase Access and Availability of Nutritious Food***

The consumption of nutritious foods among students and community members is predicted to significantly increase, thus this criterion ranks “high” (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). This is successfully shown through Growing North’s arctic greenhouse currently operating in Naujaat (Growing North, 2017). Access to the program would not be subject to discrimination or unequal distribution since all students attending public schools would be equally eligible (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). However, there remains uncertainty around whether there is sufficient knowledge about and skills for greenhouse operation and maintenance in the long-term,

#### **12.1.4.2      *Second Criterion: Expected Impact on Local Harvesters Incomes***

This program would not provide significant supports and not contribute to local harvester's incomes, thus this option ranks "low". However, this program would provide children and youth with skills and knowledge about harvesting fruits and vegetables, and teach about healthy eating (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). This could lead to better health outcomes in the long-term which may positively impact local communities (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). Tarasuk (2013) supports this by explaining that the lack of access to nutritious foods poses great threats to the health of community residents, including Inuit children who are at great risk of nutrition deficiency and debilitating health outcomes (Tarasuk, 2013).

#### **12.1.4.3      *Third Criterion: Expected Impact on Traditional Sharing Practices***

Although food from this program would be locally produced, it is unlikely that this program would support traditional sharing practices since arctic greenhouses are new to Nunavut. As such, this criterion ranks "low".

## **12.2. Budgetary Costs to Government**

All four programs are predicted to impose direct costs to government. Cost estimates are summarized in "Table Four: Total Budgetary Costs".

### **12.2.1.      Program 1: Country Food Markets**

Determining precise cost predictions for Nunavut is challenging since previous CFM's only operated in the territory's capital Iqaluit (Project Nunavut, 2017). Costs are estimated to be three times more expensive than southern Canada due to importing skilled labour, higher construction costs, and higher maintenance costs on permafrost (CCA, 2014). Insight from Sanaqatiit Construction (a general contractor that specializes in the design and construction of commercial, industrial, and institutional buildings in Northern Canadian communities) explains that the average cost per square foot to build a small retail store ranges from \$320 per square foot in Iqaluit to \$1,280 per square foot

in more remote communities (Personal Communications, March 23, 2018). Considering the average size of a small retail stores is roughly 5,775 square feet, costs to build one new fully enclosed market with running water and electricity would range from \$1,848,000 to \$7,393,000 depending on the accessibility of communities. Since electricity costs roughly \$252 per 915 square foot per month (Numbeo, 2018), an additional \$1,593 per month (or \$20 thousand per year) would be incurred. The cost of electricity varies depending on geographical location (according to Qulliq's rate schedule energy costs range from 52.39 ¢/kWh in the capital Iqaluit to 102.71 ¢/kWh in Kugaaruk) (Brusilow, 2011). There would be additional costs imposed on governments (both federally and territorially) and non-government organizations related to implementation, management, evaluation, and administration (Natcher, Phone Interview, March 14<sup>th</sup>, 2018).

However, similar to the CFMs implemented through Project Nunavut in Iqaluit and CFMs currently operating in Greenland, many communities would only require one or two markets in the form of an outdoor kiosk or large tent (Project Nunavut, Personal Communication, March 28<sup>th</sup>, 2018). More populated communities and primary hunting ports (such as Iqaluit) may benefit from larger CFMs that are potentially enclosed. The average cost of an outdoor kiosk is \$2,500. For kiosk customizations, costs can increase up to \$20,000 (Cost Owl, 2017). If all 25 communities in Nunavut implemented two CFM in the form of an outdoor kiosk (at the average cost of \$10,000 per kiosk) the total cost to implement CFMs would be roughly \$500,000. To ensure success, the design and operation of CFMs should be developed based off each community's size, needs, and distinctiveness (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). It may be more feasible to hire builders to construct market stalls in larger communities rather than transporting kiosks (depending on location and accessibility). Materials would need to be obtained from southern suppliers given the limited number available in Nunavut (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). Further research regarding the most effective design and implementation of CFM's in communities would help determine precise budgetary costs to government (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

### **12.2.2. Program 2: Food Acquisition Program**

Various costs would be incurred under a Food Acquisition Program, since food would be directly purchased from local markets (such as Country Food Markets) and

distributed as part of a territorial School Meals Program. Predictions from an expert interview in the Ministry of Health estimate that a territorial School Meals Program (feeding all 8,000 enrolled students with two meals and a snack per day in all of Nunavut's 43 public schools from kindergarten to grade 12) would cost roughly \$12 million per year if food was obtained from southern suppliers (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018). The Public Health Nutritionists of Saskatchewan (2016) supports this by explaining that in Saskatchewan's far north the average cost for two meals and a snack per student per day is \$8.59. Since there are 8,000 enrolled students and 182 school days per year in Nunavut, the cost of this program would equal roughly \$12 million (assuming that each student cost \$8.59 per day). This includes costs associated with transporting, storing, and preparing food. Since food would be obtained from local suppliers, transportation costs would be significantly less under this program. If two labour staff were employed eight hours per day five days a week (paid Nunavut's minimum wage of \$13 per hour) to help transport food an additional \$50 thousand would be incurred under this program. Additional costs related to administration would be imposed on Nunavut Tunngavik and municipalities, along with the Hunters and Trappers Organization and the Department of Economic Development and Transportation for monitoring and evaluating this program. Although costs would be incurred for gas used to transport food, the Fuel Tax Rebate Program (which provides tax rebates for vehicles used for harvesting) would cover the majority of these expenses. As such, it would be safe to assume that a Food Acquisition Program and a School Meals Program would not exceed \$12.5 million per year.

### **12.2.3. Program 3: School Meals Program**

Considering most public schools in the territory already contain the necessary infrastructure, as many schools offer breakfast programs, costs would not be imposed on building kitchens (S.O., Phone Interview, March 13<sup>th</sup>, 2018). For schools that do not contain a kitchen costs would be incurred. Decker (2017) explains that the cost of a commercial kitchen for a small business starts at roughly \$15,000 depending on where supplies are obtained sourced.

As for staff, an expert interview with DueNORTH explains that most schools employ enough staff that would be required to run a meals program (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). However, employee turnover in schools is exceptionally high

since many teachers are southerners employed on short-term contracts; on average southern teachers are employed for as little as seven months (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). To ensure enough employees are available to operate this program employing additional staff specifically for a meals program may be required. As mentioned, rough predictions estimate that a Food Acquisition Program and a School Meals Program would not exceed \$12.5 million per year. Considering the distinctiveness of communities and schools throughout the territory, further research of Nunavut's 43 public schools would help determine whether current infrastructure is sufficient to meet program requirements, whether schools contain the required number of staff to operate this program long-term, and determine precise budgetary costs (Jagow, Phone Interview, March 5<sup>th</sup>, 2018).

#### **12.2.4. Program 4: School-Based Arctic Greenhouse Initiative**

If materials are obtained from southern suppliers, building one arctic greenhouse 16 feet in height and 14 feet in diameter costs roughly \$125,000 (translating to \$70.86 per square foot) and takes around one week to completely construct (Canning, Phone Interview, December 1, 2017). There would also be additional labour costs incurred to help operate each greenhouse. However, Growing North has created a training manual and helps local communities find grants to hire operational managers, which has increased job opportunities in communities (Canning, Phone Interview, December 1, 2017). If no grants or funding for labour is available, two labour staff employed eight hours per day five days a week (paid Nunavut's minimum wage of \$13 per hour) would cost an additional \$2.1 million per year for all 43 greenhouses. Given the number of public schools throughout the territory, funds may come from both the federal and territorial government since one arctic greenhouse for all 43 public schools could cost roughly \$5 million (excluding labour costs) (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

Additionally, there would be costs incurred from operating, maintaining, and repairing greenhouses; costs depend on the size of the system in operation. For the greenhouse built in Naujaat, two years of operational supplies (including fertilizer, measurement tools, and any repairs) cost roughly \$1,000 per year. In terms of water, the Naujaat facility used less water than a single home on a monthly basis. In terms of electricity, the two main schedules (summer and winter) varied, with summer averaging

27kWH a day and winter averaging 207kWH a day due to running additional lighting. Those costs are directly tied to the cost of electricity locally which vary depending on geographical location (according to Qulliq's rate schedule energy costs range from 52.39 ¢/kWh in the capital Iqaluit to 102.71 ¢/kWh in Kugaaruk) (Brusilow, 2011). This translates to roughly \$14 to \$28 per day, \$434 to \$838 per month, and \$5,208 to \$10,056 per year. In terms of maintenance, there is required maintenance after 5 to 7 years, costing roughly \$1,000 plus installation, and the outer sealant of the structure may need to be replaced every 10 to 12 years. For larger damages all materials are readily available and can be shipped to locations quickly (Canning, Phone Interview, December 1, 2017). In sum, if labour costs are covered by grants from existing programs it would be safe to estimate an extra \$12,056 per year for supplies, electricity, maintenance, operation, and repair costs per arctic greenhouse. For all 43 public schools in Nunavut, this would be roughly \$496,908 per year.

Despite this policy imposing costs, greenhouses would only need to be built once meaning most of the costs would be a one-time payment from the federal government (Harrison, Phone Interview, March 15<sup>th</sup>, 2018). If governments are hesitant to provide funding for all expenses, produce could be sold (rather than donated) to local community markets to help cover costs (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

### **12.2.5. Total Budgetary Costs**

Total budgetary costs to government are dependent on the specific design and operation of these programs, and on how many communities have the capacity required for implementation and administration. The CFM and arctic greenhouse is estimated per unit.

**Table 4: Total Budgetary Cost**

Program:	Government Jurisdiction:	Responsible Departments:	Estimated Annual Costs:
<b>Country Food Markets</b>	Federal; Territorial; Municipal	Health Canada; Agriculture and Agri-Foods Canada; INAC; Hunters and Trappers	<p><b><i>Capital Costs:</i></b></p> <ul style="list-style-type: none"> <li>• \$1.8m - \$7.3m (one fully enclosed CFM)</li> </ul>

		<p>Organization; Nunavut Tunngavik; the Department of Economic Development and Transportation</p>	<ul style="list-style-type: none"> <li>• \$2.5k - \$20k (one outdoor kiosk CFM)</li> </ul> <p><b><i>Operational Costs:</i></b></p> <ul style="list-style-type: none"> <li>• \$20k per year (electricity costs for fully enclosed CFM)</li> <li>• \$5k per outdoor CFM per year (administration costs – rough estimate)</li> <li>• + potential repairs</li> </ul> <p><b>Total Operational Costs = \$5k per outdoor CFM per year (or \$25k per enclosed CFM)</b></p>
<b>Food Acquisition Program and School Meals Program</b>	Federal; Territorial; Municipal	<p>Health Canada; Agriculture and Agri-Foods Canada; INAC; Hunters and Trappers Organization; Nunavut Tunngavik; the Department of Economic Development and Transportation; Department of Education; Ministry of Health</p>	<p><b><i>Operational Costs:</i></b></p> <ul style="list-style-type: none"> <li>• \$290k per school per year, or \$12.5m per year for all 43 schools (transporting, storing, and preparing food)</li> <li>• \$50k per school per year (for two additional staff to transport food)</li> <li>• + additional administration costs; vehicle maintenance costs; potential kitchen infrastructure (roughly \$15k per kitchen)</li> </ul> <p><b>Total Operational Costs = \$340k per school per year</b></p>
<b>School-Based Greenhouse Initiative</b>	Federal; Territorial; Municipal	<p>Health Canada; Agriculture and Agri-Foods Canada; INAC; Hunters and Trappers Organization; Nunavut Tunngavik; the Department of</p>	<p><b><i>Capital Costs:</i></b></p> <ul style="list-style-type: none"> <li>• \$125k per arctic greenhouse (16 feet in height and 42 feet in diameter)</li> </ul>

		Economic Development and Transportation; Department of Education; Ministry of Health	<p><b><i>Operational Costs:</i></b></p> <ul style="list-style-type: none"> <li>• \$12k per year per greenhouse (including supplies, electricity, maintenance, operation, and repair costs)</li> <li>• \$50k per year per greenhouse (for two additional staff to help grow produce)</li> <li>• + potential additional repair costs</li> </ul> <p><b>Total OC = \$62k per year per greenhouse (depending on size)</b></p>
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## 12.3. Ease of Implementation and Administration

All four programs are predicted to be complex to implement and administer, thus all four programs received a “low” ranking.

### 12.3.1. Program 1: Country Food Markets

For implementation, the purchasing and construction of CFM kiosks throughout Nunavut’s communities (where capacity is deemed achievable) would be required. Federally, Health Canada and Agriculture and Agri-Foods Canada could set the administrative rules, technical guidelines, and regulatory standards for this program. Funding would be obtained from INAC and distributed to municipalities and Nunavut Tunngavik. This program would be managed and supported by municipal authorities and Nunavut Tunngavik’s NHSP Department. Decisions affecting the markets would be negotiated with the Hunters and Trappers Organization to ensure fair practices (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

### **12.3.2. Program 2: Food Acquisition Program**

Similar to CFMs, this program would be federally funded and the administrative rules and regulations would be federally established. Municipalities and Nunavut Tunngavik would be responsible for managing this program (including the distribution of funds to local markets and the receiving of funds from the federal government), and decisions impacting food markets would be negotiated with the Hunters and Trappers Organization. The Department of Transportation and Economic Development would help resolve issues related to the transportation of food from markets to community storage facilities and schools.

### **12.3.3. Program 3: School Meals Program**

This program would rely heavily on program two since a significant portion of the program's food would be obtained from the Food Acquisition Program and program four. The difficulty of implementation would thus depend on the required effort for policy option two and four.

In addition, the Department of Education would need to play a role in monitoring and evaluating this program, including working with a nutritionist from the Ministry of Health that helps design food menus aligned with nutrition standards set by Health Canada. There would also need to be collaboration between territorial school boards and the Department of Education to resolve locally identified issues (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

### **12.3.4. Program 4: School-Based Greenhouse Initiative**

The Department of Education could design the nutrition course and territorial school boards could help identify and resolve locally identified issues (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). An expert interview emphasizes the importance of including community members during the design and operation of this policy (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). Engagement with construction companies to build the greenhouses would also need to be established. Since building an arctic greenhouse takes roughly one week, all 43 public schools in the territory could have a fully functional greenhouse in less than ten months if one greenhouse was built per week (Canning,

Phone Interview, December 1, 2017). Administration of the greenhouses would also be relatively simple, since students registered in the nutrition course would help plant and maintain produce. However, it would be necessary to hire some full-time labour teams to manage and grow produce (especially in kindergartens since students would be unable to contribute); this could be funded by grants from existing programs such as the Country Foods Distribution Program (Canning, Phone Interview, December 1, 2017).

To ensure each arctic greenhouse is producing enough fruits and vegetables to adequately meet the nutritional needs of communities, each greenhouse would need to actively grow year-round and be strategically designed to meet the nutritional needs of each community on an annual basis (Canning, Phone Interview, December 1, 2017).

Health Canada and the Department of Agri-Food and Agriculture Canada would need to determine the most efficient growing practices, determine how much produce should be allocated for school meals, and determining how much produce should be distributed into communities (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

## **12.4. Stakeholder Acceptance**

All four programs are predicted to be moderately accepted among stakeholders, thus all four programs received a “medium” ranking.

### **12.4.1. Program 1: Country Food Markets**

MacDonald (2012) explains there is a developing consensus around whether CFMs would contribute to a better outcome. Through 45 semi-structured interviews, Ford (2016) finds that participants viewed a reliable marketplace and guaranteed prices for hunters as income assurance. Participants noted that professional hunting would be considered a viable livelihood option, thus safeguarding the ability to hunt (Ford, 2016). CFM's are also viewed as a potential option to foster life skills training for younger Inuit, positively impacting employment and community pride (Myers, 2002).

Although social stigma surrounding the sale of country food continues to soften, Ford (2016) explains that there have been fundamental concerns about how the

development of CFMs could undermine sharing networks and cultural identities. Within belief systems common to Inuit, harvesting and sharing food is often viewed as a gift from nature, thus food belongs to the people and does not have a cash value (Ford, 2016). As such, this program would need to be sensitive to the cultural impacts that could occur, including further destabilizing food insecure regions due to vulnerable populations diverting away from CFM sharing networks (Ford, 2016). An expert interview strongly suggests that further stakeholder engagement must be conducted prior to the implementation of new programs to determine whether those most impacted are in support (S.O., Phone Interview, March 13<sup>th</sup>, 2018).

On the territorial and municipal level, there is no indication that this program would not be supported considering the existing levels of support for projects that improve the viability of Nunavut's harvesting economy and increase access to affordable country foods (Elliot, Phone Interview, Dec. 13<sup>th</sup>, 2017).

Depending on the source of funding for markets, there could be pushback from the federal government to fund CFM's. As for current food retailers, there is no indication that there would be any resistance to CFM's due to the significant reliance on local markets (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

It is likely there could be skepticism around whether the number of hunters can supply enough food for program demands (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). However, Cecco finds (2015) that communities in Nunavut that hunt full-time are able to produce enough food supply to feed entire communities. Therefore, if hunting was better supported by guaranteeing a source of income for hunters and by establishing effective food sharing networks it is predicted that hunting would be a viable livelihood option; meaning hunters could harvest full-time and supply enough food for demands (Ford, 2016).

#### **12.4.2. Program 2: Food Acquisition Program**

Chan (2006) explains many Nunavummiut emphasize that increasing federal and territorial supports for local harvesters (such as extra funding directly through wages for hunters, or to existing organizations and programs that expand services and decrease costs) will help pass on traditional knowledge, pass on skills to younger generations, and

increase the consumption of traditional foods. As such, this program would cater to these needs since food that is purchased from local markets would be distributed to schools as part of a meals program, thus increasing incomes for harvesters and increasing the consumption of traditional foods among food insecure populations.

It is predicted that non-government organizations may be in support of a Food Acquisition Program. Through an expert interview Nunavut Tunngavik expressed strong acceptance for this option (Elliot, Phone Interview, Dec. 13<sup>th</sup>, 2017). Project Nunavut may be in support due to their continuous involvement and advocacy in supporting the local harvesting sector (Project Nunavut, 2017).

On the territorial and municipal level, there is no indication that this program would not be supported considering the existing levels of support for projects that improve the viability of Nunavut's harvesting economy and increase access to affordable country foods (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018). Additionally, pushback from retailers is unlikely (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

Despite widespread acceptance, this policy could face resistance from specific stakeholders. Federally, there could be pushback to fund this program considering the levels of funding already distributed to existing programs (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

Similar to CFMs, it is likely there could be skepticism around whether the number of hunters can supply enough food for program demands (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). However, if hunting was better supported by guaranteeing a source of income for hunters and by establishing effective food sharing networks it is predicted that hunting would be a viable livelihood option; meaning hunters could harvest full-time and supply enough food for demands (Ford, 2016).

#### **12.4.3. Program 3: School Meals Program**

On the non-government level, various organizations already advocate for the support of a School Meals Program, including Feeding Nunavut. Through a phone interview, Nunavut Tunngavik expressed their strong level of acceptance for this policy option (Elliot, Phone Interview, Dec. 13<sup>th</sup>, 2017). As for school boards, there is no indication of any public resistance to such a policy being implemented (Harrison, Phone

Interview, March 15<sup>th</sup>, 2018). DueNORTH supports this by highlighting that “school boards are crying out for a meals program in the territory” (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). For food retailers, it is predicted there would not be pushback (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

Among Nunavummiut, it is possible that food preferences among specific groups and individuals may not align with this policy. Further stakeholder consultation is needed to determine whether Nunavummiut would be in favour of consuming a green-based diet and country food as part of a School Meals Program (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018).

On the territorial level, there is no indication of resistance to this policy (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018).

On the federal level this policy could face pushback. Colabrese (2017) explains that there is often federal pushback to fund School Meals Programs because the federal government does not see education as part of its jurisdiction, but rather falls to the provinces and territories. Nonetheless, the federal government has shown commitment to reduce food insecurity levels by providing significant financial support for food insecurity policies (including funding over \$60 million per year for NNC).

#### **12.4.4. Program 4: School-Based Greenhouse Initiative**

On the non-government level, there may be approval since current school food programs are seeking funds and supports to help reduce food insecurity (Feeding Nunavut, 2015). Through a phone interview, Nunavut Tunngavik expressed their level of acceptance for this policy (Elliot, Phone Interview, Dec. 13<sup>th</sup>, 2017). As emphasized in an expert interview, there is no indication of any public resistance to such a policy being implemented among school boards and residents of Nunavut. Rather, this program has shown to be widely accepted (Canning, Phone Interview, December 1, 2017).

However, this policy option could experience resistance from the federal government regarding funding the program. Additionally, food preferences among Nunavummiut may not align with this policy, although there has been a growing acceptance and interest in northern greenhouses and a plant-based diet (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). More stakeholder research (particularly among

Indigenous communities) is strongly recommended prior to implementation to determine whether Nunavummiut would be in favour of consuming a plant-based diet alongside country foods (S.O., Phone Interview, March 13<sup>th</sup>, 2018).

## **12.5. Implementation and Administration**

The combined policy solution consisting of four integrated programs could be implemented under the NHSP to help improve and address some of the barriers existent in current programs. These barriers include insufficient support for full-time hunters, a lack of operational funding, a lack of program integration and consistency, underutilization and inaccessibility of program benefits, and the lack of partnerships between government departments and agencies (Rocha, Phone Interview, March 25<sup>th</sup>).<sup>21</sup> Considering the NHSP has already established a central governing department (the NHSP Department within Nunavut Tunngavik) responsible for overseeing the administration and implementation of programs offered, these programs could easily be put into action (Rocha, Phone Interview, March 25<sup>th</sup>).

The success of this combined policy solution would depend on an inter-sectoral initiative between numerous governing bodies (Rocha, Phone Interview, March 25<sup>th</sup>). Federally, Health Canada and Agriculture and Agri-Foods Canada could set the administrative rules, technical guidelines, and regulatory standards for each program. Funding would be obtained from INAC and distributed to municipalities and Nunavut Tunngavik, considering INACs involvement in funding previous and current food insecurity policies.

Within the territory, programs would be managed and supported by municipal authorities and Nunavut Tunngavik's NHSP Department. Decisions affecting the markets would be negotiated with the Hunters and Trappers Organization to ensure fair practices (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). The Hunters and Trappers Organization

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<sup>21</sup> It is important to note that this policy option does not advocate for the discontinuation of existing programs under the NHSP and does not devalue the importance these programs have on affected populations, rather this policy aims to address some barriers existent in current programs and aims to improve the long-term health of Nunavummiut.

would also play a crucial role in conducting quarterly to yearly evaluations of specific programs such as the CFMs and the Food Acquisition Program. The Department of Economic Development and Transportation could help resolve issues related to the distribution of food from markets to programs (Hyndman, Phone Interview, Dec.12, 2018).

For the School Meals Program and the nutrition course offered through the greenhouse initiative, the Department of Education would establish strong guidelines around what a healthy diet consists of, around respecting traditional practices, and around local eating preferences (Harrison, Phone Interview, March 15<sup>th</sup>, 2018). There would need to be collaboration between territorial school boards and the Department of Education to monitor and evaluate these programs (Thompson, Phone Interview, March 16<sup>th</sup>, 2018). The Ministry of Health would also need to continue employing a nutritionist on their staff that oversees the development of food menus and nutrition standards, and provides recommendations on the energy content needed in meals offered per day aligned with nutrition standards set by Health Canada (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018).

Participating harvesters would not require a general hunting licence. The Nunavut Land Claims Agreement (NLCA) codifies the right for Inuit to harvest wildlife, resources, and stipulating; meaning that Inuit have the right to freely sell, barter, exchange, and give away wildlife. Hunters are thus not required to have a general hunting licence (Ford, 2016).

It is important to emphasize that these integrated programs do not address the growing threat climate change has on food insecurity (including shorter hunting seasons, changing animal migratory routes, and declining species), the impact hunting quotas have on specific communities, and the impact the Firearms Act has on accessing hunting equipment (Settee, Phone Interview, March 12<sup>th</sup>, 2018). This policy could experience pushback from environmental groups due to relying heavily on hunting. Additional long-term solutions that make hunting more accessible (such as improving the transportation sector so harvesters can hunt in different regions and on thicker ice sheets) is necessary (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). An expert interviewee suggests that future policy initiatives should work closely with the Nunavut Wildlife Management Board (NWMB) and Arctic Council to help sustain animal species

Nunavummiut are most reliant on, including lake trout, arctic char, caribou, and tarbagan (S.O., Phone Interview, March 13<sup>th</sup>, 2018). Additional solutions should also focus on increasing the supply of local food by recapturing food exported out of the territory, as there is roughly \$1 billion of exported food (or 800 million kilograms) leaving Nunavut per year (Natcher, Phone Interview, March 14<sup>th</sup>, 2018).

## **Chapter 13. Policy Recommendations**

Based on the systematic analysis of policy criteria, this study has assessed a combined policy solution consisting of four integrated programs under the NHSP, that could be implemented as pilot projects in three territorial communities of divergent size (small, medium, and large) and administrative capacity. The advantage of beginning as pilot projects is that it provides the opportunity to experiment with policy development prior to implementing a territorial-wide policy potentially subject to inefficiencies and contributing barriers. Pilot projects are far less costly, less administratively complex, require few bureaucratic and political obstacles, provide administrators with the necessary tools to develop and meet the capacity needs of communities, and allow for greater flexibility and community involvement. To ensure success, pilot projects should be developed over a series of years to gather sufficient data on the programs strengths and weaknesses.

The implementation of all four programs under the NHSP would have the greatest impact. Country Food Markets would increase access to and the availability of traditional foods in local communities while supporting local harvesters (Settee, Phone Interview, March 12<sup>th</sup>, 2018). A Food Acquisition Program would help secure incomes for local harvesters and increase the amount of nutritious and culturally valued food in Schools (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). A School Meals Program would improve the health of school aged children while helping support local harvesting by requiring that a significant portion of food offered comes from local markets (Jagow, Phone Interview, March 5<sup>th</sup>, 2018). A school-based greenhouse initiative would increase knowledge about nutrition and increase the consumption of nutritious foods among many Nunavummiut (Thompson, Phone Interview, March 16<sup>th</sup>, 2018).

This policy package is designed to target populations most vulnerable to food insecurity in Nunavut, particularly Indigenous communities, children, and those identified as severely food insecure. As shown in the policy matrix, these programs are all relatively equitable among affected populations, can contribute to improved health outcomes among Nunavummiut, and are all relatively accepted among stakeholders consulted.

Although determining specific cost predictions is challenging and not feasible for this research, providing a high-level estimate of the financial resources that may be required by the federal and territorial governments to implement a pilot project in three territorial communities of divergent size helps to provide context for the potential impact on government expenditures. Based on the estimated annual cost predictions, the total capital cost to implement all four programs in three territorial communities of divergent size (small, medium, and large) as pilot projects would be \$1.6 million. This is assuming that CFMs are implemented as outdoor kiosks; capital costs ranging from \$2.5 thousand in Nunavut's smallest community of 129 people in Grise Ford, to \$11.25 thousand in Nunavut's most median sized community of 437 people in Chesterfield Inlet, to \$20 thousand in Nunavut's largest community of 7,740 people in Iqaluit. As for the greenhouse initiative, cost assumptions are based on Growing North's 1,764 square foot greenhouse operating in Naajat that is able to feed 614 people with fresh fruits and vegetables everyday. This translates to 2.86 square feet per person per greenhouse, and \$70.86 per square foot. As such, capital costs for this program would range from \$26.2 thousand in Nunavut's smallest community of 129 people in Grise Ford, to \$88.8 thousand in Nunavut's most median sized community of 437 people in Chesterfield Inlet, to \$1.5m in Nunavut's largest community of 7,740 people in Iqaluit.

Apart from capital costs, the total operational costs for all four programs in three territorial communities of divergent size is estimated to equal \$1.2 million per year. This is assuming an additional \$5 thousand is incurred for administration costs for each outdoor CFM. This is also assuming an additional \$62 thousand is incurred for yearly supplies, electricity, maintenance, operation, and repair costs for each greenhouse per year. Calculations for the Food Acquisition Program and School Meals Program are based on dividing the total costs of a territorial-wide school's meals program per year (\$12.5m) by Nunavut's 43 schools, adding supplementary operational costs (\$50,000 per school), and multiplying that number by three schools. These operational costs do not include additional administration costs, potential kitchen infrastructure costs (roughly \$15 thousand per kitchen), and potential major repair costs for these programs.

There is no question that these programs are very complex to implement and administer. It is also no question that these programs come with high costs to governments. However, the federal government has shown commitment to financing northern food insecurity initiatives despite high costs to government. In 2016 alone,

INAC spent roughly \$60 million on NNC and the program expanded to reach 37 additional remote northern communities (Nutrition North Canada, 2017). Despite this substantial contribution, NNC failed to adequately pass on subsidies to consumers, the program did not identify eligible communities based on needs, there have been poor evaluations conducted, and the program does not require retailers to verify the contributions they receive (Office of the Auditor General of Canada, 2014). Should the federal government allocate 3% of the NNC yearly budget (or \$1.6 million) towards programs that are predicted to significantly reduce food insecurity (such as the recommendations put forward in this report), this revenue would far exceed the required capital costs needed to implement these pilot programs. An additional 2% of the NNC yearly budget (or \$1.2 million) would also need to be distributed per year to cover operational costs for these four programs. If the federal government is unable to cover costs for all four programs, considering budgetary constraints and program complexities, this report recommends implementing the school-based greenhouse initiative. This is due to the greenhouse initiative not being dependent on the establishment of food markets or hunting and fishing, and being able to provide a substantial portion of the daily recommended amount of nutrient intake per day necessary for the maintenance of good health.

Nonetheless, many questions regarding the implementation of policies will need to be considered. Some of these include what year these programs should take effect, how should these programs be designed, what are program requirements, should programs be implemented across the territory or only in specific regions, do Nunavummiut want to consume a green-based diet alongside country food, will school aged children adjust to a green-based diet, will marketizing food undermine culturally valued food sharing, should other policies be implemented alongside these recommendations, and should other programs be discontinued. This project is limited by the lack of local community engagement with populations most impacted by food insecurity in the territory. Further stakeholder interviews and local engagement (particularly among Indigenous Nunavummiut) are needed to see whether the policy ideas in this research would be acceptable to Nunavummiut and practicable in communities in Nunavut. Thus, the overall recommendation of this paper is to further study the viability of this policy package as a component of existing programs and a broader set of initiatives to address food insecurity.

## **Chapter 14. Conclusion**

There are many angles to the topic of food insecurity in Nunavut that this paper was unable to explore. It is critical to emphasize that this combined policy solution would not entirely solve food insecurity in Nunavut. Food insecurity is exceptionally complex in its history and drivers; meaning no singular policy response can sufficiently eradicate food insecurity. Solutions addressing this topic need to be holistic, as each facet of food insecurity cannot be looked at in isolation (Public Policy Forum, 2015). Solutions need to also address the underlying causes of food insecurity, including widespread poverty and the inaccessibility of remote communities (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018). In addition, future solutions that address the growing threats of climate change (including decreasing wildlife, melting ice that shortens hunting seasons, and changing animal migratory routes) need to be considered (Prentice, Phone Interview, March 9<sup>th</sup>, 2018). There is a wide variety of other potential policy solutions that could be explored. For additional potential policy solutions that could be analyzed see Appendix B: Other Potential Solutions.

Additional research is also necessary to gather rigorous evaluations of existing policy initiatives (Natcher, Phone Interview, March 14<sup>th</sup>, 2018). A critical element in the success of public programs is ensuring that stakeholders have an opportunity to provide input into the identification of needs, program objectives, and the effectiveness of delivery mechanisms (CDC, 2008). Governments, non-government organizations, and the private sector also need to collectively collaborate to develop future solutions (particularly related to the implementation and administration of programs) (Public Policy Forum, 2015).

Further research could explore more in-depth jurisdictional scans and case studies, and interview experts involved in the policy making process in various regions. Lastly, future research could explore the policy implications of transporting food between arctic communities, emerging technologies, and emerging techniques related to growing and harvesting arctic food (Prentice, Phone Interview, March 9<sup>th</sup>, 2018).

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# **Appendix A. Existing Policies: Canada and Nunavut**

## **Canadian Responses:**

There are no national policies explicitly addressing food insecurity. Rather, numerous Canadian wide social policies have been implemented which help those who are food insecure. These are (Agriculture and Agri-Food Canada, 2008):

- The Community Action Program for Children (1993)
- A Revision of National Nutritious Food Baskets (1974)
- The Aboriginal Head Start in Urban and Northern Communities Program (1995)
- Canada's Prenatal Nutrition Program (Indigenous component) (2008)
- The Aboriginal Diabetes Initiative (2010)
- The Community Food Action Initiative
- Employment Insurance
- Social Assistance
- Subsidized Housing
- The National Child Benefit Program

## **Nunavut**

### **Federal Level**

#### ***Food Subsidy Programs:***

##### **❖ Food Mail Program & Nutrition North Canada (NNC):**

On the federal level, the government previously subsidized food in all the territories and the northern parts of six provinces through the Food Mail Program beginning in the early 1960s. Under the Food Mail Program, INAC provided funding to Canada Post to help reduce costs associated with shipping nutritious perishable food and other essential items (Glacken, 2009). From 2007 to 2008, funding for the program cost \$45.2 million, over 17.8 million kilograms of goods were delivered, and most goods went to retailers (Stanton, 2011).

The Food Mail Program was criticized for (Stanton, 2011):

- Lacking *food eligibility* - including the subsidy not covering specific foods (such as flour) and essential non-food items (such as diapers, toothbrushes, and soaps)
- Poor *claims processes* - such as delivering on-time, coverage against spoilage, or delivery confirmation
- Poor *awareness* of the program and its impacts on food security
- Lack of *accountability* – no requirements for retailers or transporters to report their sales or cost information
- Poor *logistics* – lack of monitoring quality control
- Inadequate *Cultural appropriateness* – lacking the support of traditional hunting practices and healthy living

Nutrition North Canada (NNC) replaced the Food Mail Program in 2011. NNC is a subsidy program based on a market-driven model that directly subsidizes northern retailers, country food processors, and suppliers that meet program requirements for the high cost of stocking and transporting perishable nutritious food. Subsidized food includes “perishable and nutritious food items (fruit, vegetables, milk, eggs, meat, and cheese) shipped by air to eligible communities, and country or traditional food commercially-processed in the North (such as arctic char, musk-ox, and caribou) shipped by air to eligible communities” (Nutrition North Canada, 2017, p.1). Although overseen by Indigenous and Northern Affairs Canada (INAC), businesses are responsible for applying the full subsidy to consumers. In theory, consumers can purchase the subsidized food from registered northern retailers or from registered Southern suppliers (Nutrition North Canada, 2017).

The subsidy rate applied to each community is based on four overarching measures that impact the price of food. These include minimum wage, population according to the 2011 census, distance flown, and geographical distance from the supply centres to isolated communities (Nutrition North Canada, 2017). Subsidy levels also differ based off perishable nutritious foods, as there are two levels of subsidies for perishable nutritious food but only one level for country food. Level two foods, meaning a lower rate, apply to other staple food items. The government spends roughly \$60 million on the program each year, and in 2016 the program expanded to reach 37 additional remote northern communities (Nutrition North Canada, 2017).

The auditor general of Canada criticizes the NNC subsidy program in 2014 for inadequately addressing Canada’s Northern food insecurity crisis for three reasons. These include (Office of the Auditor General of Canada, 2014):

1. Identifying Eligibility – NNC does not identify eligible communities based off need
2. Passing Subsidy on to Consumers – NNC does not adequately pass subsidy on to consumers, and does not require information needed to verify the contributions/compliance reviews
3. Managing the Program – INAC has not implemented proper performance measure strategies

Following the performance audit, INAC has committed to re-evaluate the program's effectiveness. Nonetheless, the NNC program is still in effect and no changes have been implemented.

#### ***Investments in Local Food Production:***

Alongside the NNC program, the federal government has invested in local food production. In 2012, over \$400,000 was allocated to support Nunavut Inuit offshore fisheries over a two-year period. In 2015, the federal government also allocated over \$7 million for three fisheries science and research projects in Nunavut (Public Policy Form, 2015).

#### ***Other Programs:***

##### **❖ Climate Change Adaptation Program (CCAP):**

This program recognizes the increasing challenges climate change has on hunters and fishers residing in Nunavut by helping Indigenous and northern communities work towards the impacts created by climate change. The CCAP provided up to \$200,000 to selected projects in areas such as infrastructure vulnerability, coastal erosion, waste water management, winter roads, extreme weather events, and permafrost degradation in the North. The program was previously operated by INAC, but terminated in March 2016 (INAC, 2016).

## **Federal and Territorial Level:**

#### ***Educational Programs:***

The federal and territorial governments fund and manage a variety of educational programs related to food insecurity. These include the:

❖ Canada Prenatal Nutrition Program (CPNP) – Indigenous Component:

This program was developed to improve maternal and infant nutritional health through supports such as “nutrition counselling, prenatal vitamins, food and food coupons, counselling in prenatal health and lifestyle, breastfeeding education and support, food preparation training, education and support on infant care and child development, and referrals to other agencies and services” (Health Canada, 2015, p.1). CPNP began in 1995 and is funded by Health Canada and managed by the provincial and territorial governments.

❖ Health Canada’s Food Guide for First Nations, Inuit and Métis:

This food guide was founded on Canada’s national food guide in 2007, but was developed to reflect the values, traditions, and food choices of specific communities, and include choices from both traditional and store-bought foods (Health Canada, 2010). The program was developed through the Office of Nutrition Policy and Promotion in Health Canada but promoted through the territorial government.

***Other Programs –Contaminants Programs, Community Freezers:***

The federal and territorial governments both provide other initiatives to improve food insecurity in Nunavut. These include supporting:

❖ Contaminants Programs:

The most notable program includes the Northern Contaminants Program launched in 1991, which was designed to reduce human exposure to elevated levels of contaminants in wildlife species that are important to Indigenous traditional diets (Public Policy Form, 2015).

❖ Community Freezers:

Community freezers are designed to store traditional foods. Areas with active community freezer programs include Kugluktuk and Iqaluit.

## **Territorial Level:**

### ***Local Food Harvesting:***

#### **❖ Country Foods Distribution Program:**

This program supports projects that improve the harvesting economy and increase access to healthy country foods. The program is managed by the Department of Economic Development and Transportation, and from 2015 to 2016 the program cost a total of over \$1 million. The Country Foods Distribution program supports two aspects of the harvesting economy including:

- “\$30,000 in annual funding to communities to support locally identified initiatives that will improve the viability of the harvesting economy with additional funding available to pay for operation and maintenance. Funds are developed by the local municipalities or Hunters and Trappers Organizations based on locally identified needs and opportunities, and must support local harvesters” (DEDT, 15, 2016, p.3). There is also up to \$10,000 available to pay for maintenance and utilities costs for community freezers (DEDT, 15, 2016).
- The provision of “funding for investments into harvesting infrastructure. These funds primarily support the construction or renovation of community freezers. They can also be used for other community identified harvesting infrastructure” (DEDT, 2016, p.3).

The program is beneficial because it finances local harvests, it pays for community feasts or country related food events that promote community well-being, and it helps create grassroots commercial systems (helping institutional demand for country food at health centres, schools, and other facilities) (DEDT, 2016). Despite these programs supporting harvesters in Nunavut, NTI (2008) explains that further consideration of funding levels, delivery mechanisms, eligibility criteria, or other adjustments need to be addressed. Many support programs are under-utilized (address only one-third of demand) due to poor promotion, administrative barriers to access, and other reasons. These programs, particularly the Nunavut Harvester Support Program, also lack data and records on program utilization and are not being accessed to any significant extent (Nunavut Tunngavik Inc, 2008).

#### **❖ Fisheries Development and Diversification Program:**

The program aims to develop and diversify Nunavut's fishing industry. This is accomplished by supporting research that will develop the industry, improving funding available to support businesses partaking in program, developing new fishery resources, and providing contributions to businesses that will help develop the industry. The program is managed by the Fisheries and Sealing Division within Nunavut's Ministry of Environment, and was implemented in 2002.

Through this program, the Department of Environment will contribute up to \$50,000 for Schedule A projects and \$150,000 for Schedule B projects. The first contribution (75%) will be prior to the project beginning, and the second contribution will be following the project being completed (25%).

Schedule A projects include, test fisheries and commercial surveys, product development initiatives related to harvesting and or marketing of resources and technology, export market development and inter-settlement trade development, etc.

Schedule B projects include purchasing of fishing licences, purchasing of allocations or quotas, and purchasing of vessels or enterprises for fishing (Department of Environment, 2017).

❖ Fisheries Training Consortium:

This initiative provides training opportunities to Nunavut beneficiaries seeking to gain long-term employment careers in Nunavut's fishing industry since 2005. Those enrolled in the program are prepared for various related opportunities. The program was developed and is managed by Nunavut's Fisheries and Marine Training Consortium (a non-profit established in 2005), but the Fisheries and Sealing Division within Nunavut's Ministry of Environment is involved (Department of Environment, 2017).

❖Community Harvesters Assistance Program

Government of Nunavut provides annual funding assistance to local Wildlife Committees for distribution to their respective memberships. This program funds assist in defraying a portion of capital and operating costs of their harvesting activities (Government of Nunavut, 2017).

❖ Fuel Tax Rebate Program:

Implemented in 2006, this program offers fuel tax rebates for vehicles such as snowmobiles, all-terrain vehicles, boat motors, motorcycles, and licenced vehicles engaged in off-road activities. Off-road activities are defined as hunting, fishing, trapping, outfitting, tourism, and quarrying. To qualify, fuel must be purchased in Nunavut and be subject to taxes. Cheques are mailed out every three months to qualifying participants (Tax and Risk Management, 2010).

❖ The Hunters' and Trappers' Disaster Compensation Program:

The Hunters' and Trappers' Disaster Compensation program reimburses harvesters for equipment lost through unavoidable natural disasters, such as storms or avalanches; the program is not designed as a general insurance program for equipment damage or loss. The Program serves holders of General Hunting Licences or land claim beneficiaries dependent on harvesting for "a substantial portion" of their income (currently set at 25% of income), and the maximum compensation to individual harvesters is \$4,500 per occurrence (Tunngavik, 2008).

***Poverty Reduction:***

❖ The Makimaniq Plan 2:

Following the 2011 Makimaniq Plan being released at the Poverty Summit, the Makimaniq Plan 2 was recently launched in 2017. The Government of Nunavut and Nunavut Tunngavik Incorporated developed the plan through a public engagement process to better identify the root causes of and solutions to poverty. The Makimaniq Plan 2 highlights eight long-term goals to achieve between 2017 and 2022. These are:

- Strengthened foundation by working together
- Increased community decision-making
- Strengthened local economies
- Strengthened support for health and well-being
- Strengthened life-long learning
- Increased food security
- More supportive income assistance programs
- Increased access to housing (Makimaniq, 2017).

❖ Nunavut's Food Security and Action Plan:

Prepared by the Nunavut Food Security Coalition and built off the first Makimaniq plan in 2014, this strategy emphasizes six actions that could be taken to improve food security in Nunavut. These include improving supports for country food, store-bought food, local-food production, life skills, programs and community initiatives, and policy and legislation (Public Policy Form, 2015).

❖ **Income Assistance Program:**

The Income Assistance Program (IA) is a last resort to help Nunavut residents over the age of 18 meet their basic needs for reasons including severe disability, illness, and low-income or periods of unemployment. To be eligible for IA, individuals are required to apply to all other available programs (such as employment insurance, pension programs, works compensation programs, and child maintenance) and access all other financial resources available (Government of Nunavut, 2017).

## **Non-Government Level:**

### ***Local Food Harvesting:***

❖ **Nunavut Harvester Support Program:**

Previously the “Nunavut Hunter Support Program” until 1993, this program aims to reduce poverty levels among Inuit living in Nunavut through supporting Inuit harvesting culture and traditional ways of life. Although the program was discontinued in 2014, as of April 2017 the program offers harvesting equipment, safety equipment programs, disaster relief programs, and community hunt programs. Nunavut Tunngavik Incorporated, a legal representative of the Nunavut Inuit people for the purpose of native treaty rights and treaty negotiation, developed and is responsible for managing the program (Nunavut Tunngavik Incorporated, 2017).

Due to the program being re-implemented in April 2017, Nunavut Tunngavik is unsure of the levels of impact this program has had on supporting Inuit harvesting culture (Shylah, Phone Interview, Dec. 13<sup>th</sup>, 2017).

❖ **Project Nunavut:**

Established in 2013, Project Nunavut is an Iqaluit-based social enterprise that aims to implement projects that improve the local traditional economy. Programs involved include the outdoor Country Food Market, Project Sealift, Fisheries Research and Development, and Renewable Energy Planning (Project Nunavut, 2017).

***Food Assistance Programs:***

❖ Food Banks:

Non-profit food banks that distribute food to those who are unable to access, or purchase food are dispersed throughout the territory.

❖ Igloolik Emergency Voucher Food Program:

Funded by the non-profit organization “Feeding Nunavut”, this 2015 program distributes 20 vouchers each month (each worth \$50) to families in critical needs, meaning they have no food, no baby formula, or other essential items. The vouchers are distributed by local Igloolik social workers (Feeding Nunavut, 2017).

❖ School Food Programs:

Currently, breakfast meal programs are offered in numerous public schools throughout the territory. Despite these programs addressing food insecurity, there are no federal or territorial regulatory standards for school meals (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018). Feeding Nunavut (2015) explains that food programs operate off donated money, resulting in food quality often being poor, and fruits and vegetables not being provided. Although the Hunters and Trappers Organization may contribute, food is primarily obtained from southern suppliers through, resulting in significantly high costs for transporting food (A.M., Phone Interview, Jan. 8<sup>th</sup>, 2018). Programs are community initiated and community driven, meaning many rely on teacher volunteers or student volunteers (Feeding Nunavut, 2015).

❖ Growing North:

Growing North (originating as a Ryerson University student pilot project in 2013), built an arctic community greenhouse in Naujaat Nunavut. The solar powered air system was able to withstand the harsh arctic climate, a co-op education program through the

local high-school provided students with credits for volunteering in the greenhouse (which helped students learn about nutrition and improved their chances of graduating), and half of the 1,082-person community is now able to eat vegetables everyday (Growing North, 2017).

## Appendix B: Other Potential Solutions

As outlined in an expert interview with the Ministry of Health, other potential solutions to consider include policies that (A.M., Phone Interview, Jan.8<sup>th</sup>, 2018):

- Develop the waged based economy in communities
- Provide support for social assistance
- Provide more robust mental health and addition services
- Address the growing threats of climate change
- Improve and expand information about nutrition among Nunavummiut
- Address territorial transportation issues (potential focus on food air cargo ships)

Action Canada recommends implementing policies that (Action Canada, 2014):

- Improve hunting capacity - increasing subsidies through Capital Equipment Program
- Train youth in hunting kills - programs at arctic colleges and Inuit organizations
- Improve processing and distribution capacity – investing in community infrastructure
- Increase funding for the Nunavut Food Security Coalition
- Increase local food in stores – develop stronger linkages among local processors, hunters, and retail outlets
- Review the NNC subsidy program
- Promote the marketing of local foods in northern communities

The Food Bank recommends policy solutions that (Food Bank, 2016):

- Expand and coordinate information on the cost of food
- Increase support for research and programs relevant to climate change adaptation
- Replace social assistance with a basic annual income administered by the tax system

As suggested by an expert interviewee, more focus could be placed on (David, Phone Interview, March 14<sup>th</sup>, 2018):

- Recapturing food exported out of the territory
- Growing food in abandoned or unused mines, due to temperatures being more favorable

An expert interviewee emphasizes the potential use of (Thompson, Phone Interview, March 16<sup>th</sup>, 2018):

- Harvesting boiler chickens throughout the territory
- Food sovereignty education in school