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THE NORTHERN CORRIDOR, FOOD INSECURITY AND THE RESOURCE CURSE FOR INDIGENOUS COMMUNITIES IN CANADA

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FOREWORD

THE CANADIAN NORTHERN CORRIDOR RESEARCH PROGRAM PAPER SERIES

This paper is part of a special series in *The School of Public Policy Publications*, investigating a concept that would connect the nation's southern infrastructure to a new series of corridors across middle and northern Canada. This paper is an output of the Canadian Northern Corridor Research Program.

The Canadian Northern Corridor Research Program at The School of Public Policy, University of Calgary, is the leading platform for information and analysis on the feasibility, desirability, and acceptability of a connected series of infrastructure corridors throughout Canada. Endorsed by the Senate of Canada, this work responds to the Council of the Federation's July 2019 call for informed discussion of pan-Canadian economic corridors as a key input to strengthening growth across Canada and "a strong, sustainable and environmentally responsible economy." This Research Program will benefit all Canadians, providing recommendations to advance the infrastructure planning and development process in Canada.

This paper, "The Northern Corridor, Food Insecurity and the Resource Curse for Indigenous Communities in Canada", falls under theme *Social Benefits and Costs* of the program's eight research themes:

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ABSTRACT

Food insecurity rates for Canada's Indigenous people are the worst among developed nations, demanding immediate action to prevent an impending health crisis. Food insecurity in Canada is widespread across most First Nations households (51 per cent). The highest food insecurity rates are experienced by the Inuit in Nunavut (63 per cent), First Nations without access roads (65 per cent), and Alberta First Nations (60 per cent). Indigenous peoples' food insecurity is associated with a shorter life expectancy and higher rates of physical and mental illnesses, including four times the diabetes incidence of Canada's non-Indigenous populations. This paper analyzes the impact on food insecurity of a notional trade northern corridor to reach local and global markets, considering case studies of resource and utility corridors.

This research found that, rather than improving food security and providing benefits, trade corridors typically bring a resource curse to Indigenous communities. Also called the 'paradox of plenty,' a resource curse occurs when Indigenous communities, particularly First Nation reserves, experience mainly negative economic impacts when their resources are extracted. A resource curse on Indigenous communities is apparent across Canada, including at Norman Wells in the Northwest Territories and Shoal Lake 40 in Ontario, where oil and water pipelines have resulted in negative environmental, health and socio-cultural impacts without providing permanent road access or long-term jobs, and without reducing high food prices. Also, the resource curse is evident for Alberta's First Nations, which have the highest food insecurity rate of the country's First Nations, despite being covered in pipelines and extractive industries.

To explore the food security impacts of the notional northern corridor, we spatially analyzed its route's proximity to mineral-rich greenstone belts, roads, and Indigenous communities without all-weather road access. The notional northern corridor route transects many rich mineral deposits to reveal a focus on resource extraction. This notional route appears to prioritize the transport of resources to global markets over Indigenous communities' needs. The notional route has six ports traversing First Nation territories under the Indian Act but is nearby to only seven of the 122 Indigenous communities lacking road access. This notional route, thus, is linked to Indigenous-specific systemic racist

legislation of the Indian Act to bypass Inuit lands in Nunavut, Quebec and Labrador, where communities all lack roads but do not fall under the Indian Act. The Crown's Indian Act trusteeship over First Nations gives a legal right to usurp reserve or Crown land for any corridor or development. The Indian Act benefits industry, settler and state to access and own Native land and resources, but not First Nations except regarding sustenance activities. The Federal Crown's trusteeship over First Nations' land and resources makes First Nations' people legal "wards of the state," which has led to inequitable planning control, infrastructure and services. Signs of economic poverty are that most Indigenous communities lack food infrastructure, hospitals, and post-secondary education facilities, with 122 First Nation communities lacking all-season access roads. This inequity indicts Canada for colonialism, racism and failure to uphold the equality clause in its constitution.

The notional route to Hudson Bay indicates that First Nations and food security were not fully included in the conception phase of the Northern Corridor. The notional route cuts through the Indigenous-led protected area proposed in the Seal River Watershed to reach Hudson Bay via Churchill rather than Port Nelson. This notional route would undermine the Indigenous-led protected area and the migration of the threatened Caribou population. Oppositely, the NeeStaNan corridor proposed by Fox Lake, York Factory and other First Nations goes to Port Nelson and avoids the Seal River Watershed. Free, prior and informed consent should start at the conception phase to include Indigenous interests. In Northern Canada, where Indigenous people comprise the vast majority, infrastructure development should be Indigenous-led to prioritize Indigenous food security. An Indigenous-led, adequately funded strategy to end food insecurity in Canada's Indigenous communities within the next decade is needed to turn around a health and human rights crisis. Removing Indigenous-specific systemic racist barriers to Indigenous control over Native land and adequate funding for infrastructure and services will attain Indigenous food security within a decade.

RECOMMENDATIONS

Utility or resource corridors lead to worse food insecurity outcomes for impacted Indigenous communities in Canada. To prevent a health and human rights emergency due to high food insecurity elevating further, an Indigenous-led food strategy, rather than a resource corridor, must be the priority so that Indigenous food insecurity can be brought to functional zero. The suggestions below indicate food security is attainable within a decade if priorities shift.

1. Restore jurisdiction over essential services to Indigenous communities from the colonial government to ensure needs and human rights are met for food infrastructure, road access, hospitals, banking and telecommunications.
2. Remove Indigenous-specific systemic racism to Indigenous people's food security, health and self-governance.
3. Address income as a key determinant of food security by applying poverty reduction strategies in Indigenous communities, including basic income, paid training/education programs and community-led development jobs.
4. Invest in Indigenous food systems in each Indigenous community, including the infrastructure, services and programs. Promising programs to scale up and out include: on-the-land traditional land-use education programs (hunting, fishing,

farming, stewardship, etc.), Arctic Co-op and community food centres on reserve.

5. Fund Indigenous community-led post-secondary education to enhance food harvesting and employability, including on-the-land programs, protected areas, land guardianship, regenerative agriculture, permaculture training, community development, watershed planning and cooking apprenticeships.
6. Shift subsidies, such as the Nutrition North Canada subsidy, from colonial stores to Indigenous food co-operatives and Indigenous people in all reserves, removing the 'middleman' and replacing the cost of the northern food basket as a success indicator with an indicator that considers health.
7. Reject the colonial approach to building utility corridors based on non-sustainable extraction of resources and instead prioritize human needs and rights of Indigenous communities for development. Establish a future-proof infrastructure to withstand climate change, accommodate distributed renewable energy and foster a zero-carbon, sustainable future. An Indigenous-governed and owned northern corridor that serves Indigenous communities' interests holds possibilities but needs a legal analysis, considering colonial control over resources and land, the Indian Act, systemic racism, and Indigenous jurisdiction for Canada's north. Ensuring First Nations' food security benefits from a northern corridor may require changes in legal standing, such as overturning the Indian Act.

1.0 INTRODUCTION

A northern corridor is proposed across northern Canada that involves the construction of roads, railways, transmission lines, northern ocean ports and pipelines (water, gas, oil, hydrogen, oil, etc.) to extract natural resources (mines and forestry) and transport them locally and globally (Fellows et al. 2020). The University of Calgary's School of Public Policy has been tasked with researching the feasibility and desirability of this multi-modal trade network, considering many issues including food security. But what are the links of food security and road access in Indigenous communities to a northern corridor? This paper aims to assess the impact of a notional Canadian northern corridor on food security, considering environmental impacts of the project and whether a probable outcome is road access for Indigenous communities without access roads to service centres with healthier food markets.

Understanding the impacts of a northern corridor on food security requires consideration of existing access, remoteness and infrastructure in Canada's northern Indigenous communities. As independent researchers, we consider these aspects in our answers to different questions posed by the School of Public Policy at the University of Calgary in 2022. Analyzing food security is part of the SPP's exploration of the potential for the Canadian Northern Corridor. First, we focus on communities without access to service centres by rejecting the term 'special access communities' and calling them 'communities without road access' or 'no-road-access communities.' The methods section provides the assigned questions, along with the scientific steps that we took to answer them. The Northern Corridor's benefits and negatives are examined through a literature review,

case studies, map analysis, and impact analysis. The School of Public Policy paper series asserts the benefits of the “multi-modal trade corridor” in providing two-way trade both internationally and inter-regionally, and this paper critiques that assertion based on our mapping of the notional corridor route and our findings on the existing resource and utility corridors’ impacts on Indigenous communities in Canada.

2.0 METHODS

This section provides the four questions posed by the University of Calgary’s School of Public Policy to independent researchers and our scientific methods to answer each. However, our research independence is impacted by the University of Calgary’s School of Public Policy’s pre-selected questions, peer review process, and the \$10,000 funding of our Mino Bimaadiziwin student researchers and \$10,000 towards the fruit and medicine tree nursery of Kitigay Ecosystem Restoration Camp upon this papers’ publication. This acknowledgement is important for the reader to consider in evaluating whether we compromised in seeking to truly understand the impact of the northern corridor on food security in Northern Canada.

The four questions focus on the many aspects of food security to understand the impact of a northern corridor on Indigenous communities. Each question was answered by applying specific methods as described in detail below.

1. What is the current state of food security in Northern Canada? How does northern food insecurity relate to other important aspects of public health, cultural values and traditions, and individual/community welfare?

A systematic literature review was conducted to examine the current state of food insecurity in Northern Canada. We searched peer-reviewed literature on Google Scholar using key terms: food security, food insecurity, traditional foods, special access, road recognize remote(ness), Indigenous health, Northern Canada, Indigenous, Inuit and First Nations. The literature research identified 128 references, which were reviewed by title and abstract to be relevant to this research. The primary sources for the statistics are the large national surveys of thousands of households across First Nation reserves and Inuit communities, specifically the First Nations Regional Health Survey (First Nations Information Governance Centre 2018), the various Nutrition and Environment Study (First Nations Information Governance Centre 2021) reports and the Nunavut Regional Health Survey and Statistics Canada (2021). Nutrition North Canada (2021) reports provided the northern food basket prices for no-road-access communities.

2. How is food (in-)security related to the remoteness of communities in Canada’s north and the lack of northern infrastructure development in Northern Canada (e.g., transportation and logistical issues)?

The many ways to measure remoteness were identified, considering the lack of northern infrastructure, particularly roads and food infrastructure. A table compiles the number of remote and no-road-access communities in each province and territory in Canada compared to urban and rural, using the Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) website’s First Nations Profiles. Statistics by Nutrition North Canada (2021) for no-road-access communities provided the food prices for the

northern food basket. Finally, to understand the experience of remoteness, case studies of two remote communities were undertaken.

3. How might the development of northern infrastructure, as could be facilitated by corridor development, mitigate the issues causing food insecurity?

The notional route from Fellows et al. (2020) of the Northern Corridor was mapped to display the relationship between the location of Indigenous communities, known locations of precious metals and potential mining interests, existing roads, and a northern corridor. We realize the notional route is illustrative only, but comes with assumptions and values that are important to explore and make apparent. Spatial analysis using overlays was applied to this notional corridor to consider the proximity to greenstone belts (mining interests) and the Indigenous no-road-access communities that might benefit from all-weather roads and construction jobs. A buffer on either side of the notional corridor (50 km across) identified the specific Indigenous communities for which this corridor could provide permanent road access within 25 km on either side.

4. How might the development of northern infrastructure impact access to traditional country foods for northern residents?
 - a. What are the potential cultural, social and economic implications of changes in access to country foods, particularly for Indigenous communities and households?
 - b. What are the potential implications of these impacts on environmental impact assessments and other permitting processes?

A review was conducted of the Canada Impact Assessment Registry (Impact Assessment Agency of Canada 2022), on July 14th, 2022, through two separate searches related to the Northern Corridor and food security. The two developments expected to result from a northern corridor are 1) roads and 2) mines. The separate search for the impacts of roads and the impacts of mines each included the terms Northern Canada, assessment, and Indigenous people. A few boreal examples were chosen as case studies to illustrate the impacts of these developments on food security.

We also mapped the notional route map juxtaposed with First Nation and Inuit communities as well as green belts and roads. The notional route map was obtained from Dr. Azaz Munzur of the University of Calgary, and was transformed with ArcGIS Pro to add different feature layers from ESRI's Living Atlas of the World (n.d) and ArcGIS Online (n.d). The greenstone belt and the First Nations of Canada layers were added from ArcGIS online (n.d.) and Natural Resources Canada (2017) respectively. The road network of Canada and permafrost layers were obtained from the Government of Canada's open data source. The Inuit community map was collected from ArcGIS online (n.d.). The communities lacking access roads were compiled from Canada's First Nations Profiles (Indigenous Services Canada, 2022) to find First Nation and other communities within 25 km of the notional corridor. The buffer tool in ArcGIS pro was used to identify communities within 25 km on either side of the notional corridor track.

3.0 THE STATE OF FOOD INSECURITY IN NORTHERN CANADA AND ITS HEALTH IMPACTS

Analyzing the state of food insecurity in Northern Canada requires a focus on Indigenous communities. In Canada, these include First Nation reserves, Métis communities and Inuit communities that constitute the vast majority of the population in Northern Canada. This research focused on the Inuit and First Nations' food security status in Northern Canada.

Community food security considers the quality and quantity of food accessible to households and the many dimensions of food access. Food security exists “when all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life” (Food and Agriculture Organization of the United Nations 2013). Food insecurity occurs: “when people do not have adequate access to sufficient amounts of safe and nutritious food needed for normal growth and development, and an active and healthy life” (Food and Agriculture Organization of the United Nations et al. 2018).

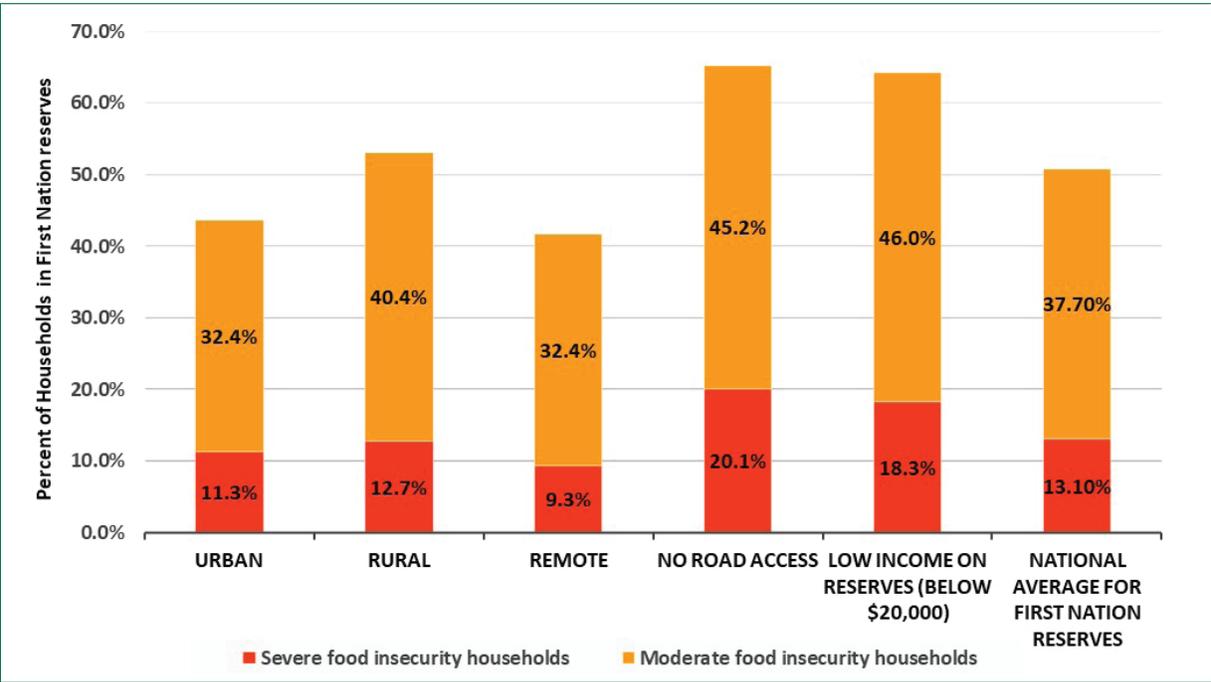
Food insecurity among Indigenous people in Northern Canada has worsened since the United Nations condemned high Inuit food security a decade earlier (First Nations Information Governance Centre 2018; Chan et al. 2019; Council of Canadian Academies 2014; Tarasuk, Mitchell and Dachner 2016; Thompson et al. 2012). The United Nations Special Rapporteur on the right to food reported in 2012 that “the highest documented food insecurity rate for any [A]boriginal population in a developed country” was among the Inuit of Nunavut, Canada (United Nations General Assembly 2012, 16). Nunavut's 52 per cent food insecurity rate (Rosol et al. 2011; Natcher et al. 2016; Leblanc-Laurendeau 2019) had increased to 63 per cent in all households and 79 per cent in households with children since the 2012 report publication (Tarasuk, Mitchell and Dachner 2016). Similarly, First Nations communities without access roads had high rates (65 per cent) of food insecurity, as did low-income First Nations communities. Higher levels existed for people impacted by residential school systems (RSS), including RSS survivors, their children and their grandchildren.

High rates of food insecurity comprise an epidemic affecting Canada's Indigenous people. The First Nations Information Governance Centre (FNIGC) numbers published in 2018 showed high rates for Indigenous households occur in urban, rural, remote and roadless communities. Compared to non-First Nations households, the majority (51 per cent) of First Nations households experienced moderate or severe food insecurity in a survey. First Nations without road access had a 23 per cent higher food insecurity rate than remote First Nations with road access (42 per cent). Indigenous households in remote (42 per cent) and urban (44 per cent) communities reported better rates of food security than both rural (53 per cent) First Nations and no-road-access communities. Without the category for marginal food insecurity included in other surveys, the FNIGC numbers underestimate the already high rate of food insecurity even further and overestimate food security.

The FNIGC's First Nations Regional Health Survey surveyed a national sample of 12,137 households across 253 representatives of First Nations but no Inuit communities, as shown in Figure 1. This national survey found that poverty was a large contributor to food insecurity, with 63 per cent of low-income households (below \$20,000) on reserve being

food insecure. Income poverty and infrastructural poverty (no road access) were found to be two factors contributing to food insecurity in First Nations. Poverty is widespread in many communities lacking access roads due, in part, to high rates of regional unemployment (First Nations Information Governance Centre 2018).

Figure 1. First Nations food insecurity in different community types and low-income households below \$20,000



Source: First Nations Information Governance Centre 2018.

Residential schools continue to have a significant intergenerational impact on food insecurity (First Nations Information Governance Centre 2018). Households with adults affected by residential schools have a significantly higher rate of severe food insecurity for the residential school attendees, their children and their grandchildren, with elevated rates of 10, 9 and 5 per cent, respectively (First Nations Information Governance Centre 2018). Children were abused, starved and food insecure in residential schools, which carries permanent and intergenerational consequences, as indicated by their families’ heightened food insecurity rates, generation after generation (First Nations Information Governance Centre 2018). The colonial government’s genocidal policy of residential schools is significantly associated with food insecurity for Indigenous people, e.g., through the interruption of intergenerational knowledge transfer about traditional food harvesting, storage and processing. Another contributing factor is the colonial policy of segregating First Nations on reserves away from urban and rural centres without basic infrastructure.

Elevated food insecurity rates for Indigenous communities in Nunavut and First Nations reserves in Canada are confirmed by every study. The First Nations Food, Nutrition and Environment Study (FNFNES) (Chan et al. 2021) and other studies report food insecurity rates in First Nations from 48 to 100 per cent (First Nations Information Governance Centre 2018; Chan et al. 2019; Chan et al. 2021; Thompson et al. 2012; Skinner et al. 2013; Oni 2021). Chan et al. (2019: 54) state that “[t]he prevalence of food insecurity is very high

in First Nations communities (48 per cent),” with “rates [being] also significantly higher in remote communities with no year-round road access to a service centre (58 per cent)”. The FNFNES (Chan et al. 2021) concludes that First Nations in Alberta have significantly higher rates of food insecurity, at 60 per cent above the average for Canadian First Nations. First Nations in Alberta even surpassed the food insecurity rate that FNFNES found at 58 per cent for the no-road-access community. Alberta has a 33,032 km pipeline network extending to Canada’s North in Zama and Fort McMurray (Canadian Energy Regulator 2022), with only one roadless community. These statistics expose that the myth of resource corridors providing food security and a good life for First Nations is false.

Food insecurity levels in Canada rose during COVID-19 (Statistics Canada 2021) and are expected to worsen with climate change and the war in Ukraine, causing food shortages and higher food prices (Agri-Food Analytics Lab 2022). Food costs rose ten per cent from April 2021 to April 2022, with further inflation expected from macro-changes (e.g., geopolitical risks, COVID-19, input costs, climate change and soil depletion) and sector changes (food retail, supply chain distribution, food processing, policies regulations, consumer awareness and growing poverty, particularly among Indigenous people) (Agri-Food Analytics Lab 2022). Rising food prices hurt lower-income households, which in Canada are disproportionately Indigenous people. Northern Indigenous communities are most impacted, as individuals in those communities spend a higher proportion of their income on basic expenses and living costs. With exorbitant transportation and energy costs, food prices in Northern Canada (Statistics Canada 2021) are expected to rise further. Statistics Canada (2020a) found that the pandemic worsened food insecurity for the people already experiencing it. One hundred per cent of a small sample in two no-road-access Island Lake communities during the COVID-19 community lockdown period were food insecure (Oni 2021).

First Nations households surveyed had both food and nutritional insecurity (Chan et al. 2021). The FNFNES diet recall study found that essential nutrients to maintain physical and mental health were lacking in the diet of many people living on reserves: “the current diet of many First Nations adults is nutritionally inadequate” (Chan et al. 2021, 7). The study found widespread inadequate intake of vitamins A, D, C, folate, calcium and magnesium amongst those eating commercial foods, but significantly improved nutrient intake for those able to include some traditional foods in their diets. In many communities, the high cost of hunting/fishing equipment and settler expansion on Native land limits access to traditional foods. Most households complained about not having enough traditional foods: 77 per cent of households wanted more, and 44 per cent ran out of traditional foods before restocking (Chan et al. 2021).

Household food insecurity lowers peoples’ quality of life, undermining physical and mental health (First Nations Information Governance Centre 2018). Diet-related diseases contribute to a lower life expectancy of First Nations’ people by nine to ten years, and eleven years for Inuit people (Tjepkema, Bushnik, and Bougie 2019). A significantly higher proportion of food-secure First Nation adults rated their general health as excellent (59 per cent) compared to those who were poor (31 per cent), while the age-standardized prevalence for diabetes among First Nations adults has more than doubled from 9 per cent in 2008-2009 to 19 per cent in 2015-16 (First Nations Information Governance Centre 2018, 66) and is four times the rate for other Canadians.

Food insecurity reduces people's quality of life. Learning and productivity are reduced when people are hungry and/or malnourished. Adults are less productive in their work and have more difficulty looking for employment (Thunder Bay Region Public Health 2021). Food insecurity in northern communities causes feelings of shame, vulnerability, powerlessness, and embarrassment, especially among the Indigenous communities (McIntyre, Connor, and Warren 2000; McCarthy, Chang, and Brimblecombe 2018; Men et al. 2021; Louie 2022).

Mental health issues arise from food insecurity and poor diets. Of those who were food secure, most (60 per cent) rated their mental health as excellent (First Nations Information Governance Centre 2018). Those experiencing moderate food insecurity were three times as likely to perceive their mental health as fair or poor, and to report moderate or severe anxiety symptoms (Statistics Canada 2020b; PROOF 2020). Similarly, diets of low nutritional value are associated with poorer mental health, including anxiety and depression (Statistics Canada 2020b; PROOF 2020). Overall, higher rates of mental health concerns are associated with increased use of the healthcare system and hospitalization (Statistics Canada 2020b).

Food insecurity is posing a widespread health crisis for Indigenous children and youth. Half of First Nations' children live in food-insecure households (First Nations Information Governance Centre 2018; Chan et al. 2021). This figure is higher (73 per cent) for children in Inuit households (Tarasuk, Mitchell and Dachner 2016).

Food insecurity is associated with chronic illnesses in youth. Food insecurity contributes to the high prevalence of approximately one-third of First Nations youth and more than one-quarter of First Nations children having one or more chronic health conditions. Undernourished children are more susceptible to illness, perform worse academically and have poorer psychosocial outcomes than food-secure peers (PROOF 2020). Child hunger is associated with hyperactivity, inattention and suicidal ideation risks in adolescence and early adulthood.

Poor diets are also associated with worse oral health (Beaudette et al. 2017; Kotronia et al. 2021). Based on a national survey (Egeland 2010), the prevalence of fair/poor oral health among adolescents aged twelve to nineteen is much higher for Inuit youth (29 per cent) and First Nations youth (19 per cent) than for other Canadian youth (11 per cent). A significant relationship was found between a delay in tooth and body growth of Inuit children and household food insecurity (Egeland 2010). Parents and caregivers in more remote communities reported twice the likelihood of their children experiencing dental problems compared to households in non-remote areas due to both processed foods and having the "greatest unmet dental needs" (First Nations Information Governance Centre 2012: 14).

Traditional food remains an important component of Indigenous people's food system, with the majority (90 per cent) of First Nation adults sharing traditional foods with their households. Also, three-quarters of the First Nations adults living in remote (77 per cent) or no-road-access (75 per cent) communities had eaten traditional foods in the last twelve months, particularly large land-based animals for protein (Chan et al. 2021; First Nations Information Governance Centre 2018).

Traditional food is nutritionally, culturally, socially, spiritually and economically important for Indigenous people (Kuhnlein et al. 1996; Michnik, Thompson, and Beardy 2021). Traditional foods are often more nutrient-dense compared to market food replacements. However, traditional foods are vulnerable to negative impacts from industrial developments, such as contamination from environmental pollution, wildlife population decreases and habitat reduction. As First Nations people decrease the proportion of traditional foods in their diets, their risks for anemia, heart disease, obesity, osteoporosis, cancer, infections, diabetes and tooth decay increase (Kuhnlein et al. 1996). Many colonial policies for economic development have undermined ecosystem integrity, wildlife abundance and Indigenous people's skills, forcing Indigenous communities away from traditional foods (Kuhnlein et al. 1996). Besides their nutritional and health benefits, traditional foods contribute to Indigenous peoples' cultural and spiritual wellbeing (Tobias and Richmond 2014). Traditional foods are integral to identity, healing and survival (Martin and Amos 2016; Lowitt et al. 2019). Cultural practices such as wildlife harvesting and ceremonies are forms of Indigenous spiritual and physical connection with the land, which helps to heal trauma and protect biodiversity (Marquina-Marquez et al. 2016). Elders believe that losing the spiritual connection with the land is responsible for the increasing rates of addiction observed on Indigenous lands (Marquina-Marquez et al. 2016).

The consequence of widespread food insecurity is a population-level health crisis of mental and physical illness. The current status of food insecurity in First Nations communities needs immediate Indigenous-led action to prevent further health crises. A holistic approach is required to approach this emergency.

4.0 REMOTENESS AND ROAD ACCESS

Remoteness is associated with food insecurity. The lack of road access to service centres results in limited commercial food options in northern Indigenous communities. A service centre is the nearest community offering government services, banks and suppliers (Government of Canada 2019). A lack of access to roads limits food access. Many northern Indigenous communities in Canada lack access roads to urban centres (Thompson et al. 2020), a status called "special access" by the colonial government. However, the lack of all-weather roads to access banks, hospitals and other services and infrastructures unavailable in their communities is not special, but inadequate. Travelling to service centres for groceries, health care, banking and other services without all-weather road access is difficult and costly. Therefore, this paper refrains from using the 'special access' misnomer and instead calls these communities 'without road access' or 'lacking access roads.' These terms recognize that seasonal roads built on ice and frozen ground, also known as winter roads, are unreliable, dangerous and impermanent, with increasingly shorter operating seasons due to climate warming. These ice roads, therefore, do not provide safe access in any season.

Table 1 shows that in most provinces and territories, First Nations and Inuit communities lack access roads to a service centre (Indigenous Services Canada 2022). This table displays the geographic remoteness of First Nations across Canada. Inuit communities are not included, but most lack these services and all lack access roads. People in Indigenous communities face a disproportionate infrastructural development gap compared to those

in other Canadian communities (Thompson, Bonnycastle, and Hill 2020). Seldom do settler communities lack roads to access service centres, and most with a population over a few hundred people have banks, hospitals and healthy food options (Adegun and Thompson 2021).

Infrastructure, also called the built environment, is a social determinant of health and quality of life (Aschauer 1990). Jochimsen (1966, cited in Buhr 2003, 1) defines infrastructure as “the sum of material, institutional and personal facilities and data which are available to the economic agents and which contribute to realizing the equalization of the remuneration of comparable inputs in the case of a suitable allocation of resources, which is complete integration and maximum level of economic activities.” Infrastructure plays a “critical, and often irreversible role in locking patterns of development” (Carlsson, Otto, and Hall 2013).

Isolation is largely defined by a lack of road and communication networks (Subedi et al. 2019). These populations in communities without road access are geographically unique, with limited supplies of goods, services and economic options (Hart, Lishner, and Larson 2005; Bell and Menec 2013; Johnson et al. 2015; Du Plessis et al. 2001). Alasia et al. (2017) found that distance, business revenue and service options determine how remoteness is experienced and travel costs. Alasia et al. (2017) found network distance and travel time present an insufficient basis to measure access for areas with limited or no road access. In the case of communities without access roads, the travel cost is deemed the only viable measure of proximity to arrive at a continuous index applicable to all communities.

Infrastructural challenges faced by the northern Indigenous communities are pervasive (Spring 2018). The gaps in infrastructure include a lack of quantity or quality limitations to safe drinking water and wastewater treatment infrastructure (e.g., cisterns rather than piped water/sewer), energy networks, roads, schools, community and youth centres, churches and grocery/general stores. Where roads are missing, warehouses for food distribution, restaurants, store options and facilities for food production are typically absent as well (Public Policy Forum 2015). Physical infrastructure, like access roads, play crucial roles in determining patterns of food security. Spinu and Wapaass (2020) criticized the structural inequities of Indigenous communities during the COVID-19 crisis:

[It is] important to look beyond the current crisis and not lose sight of the broader socio-economic inequalities facing Indigenous communities — particularly remote communities. These include severe housing shortages, limited healthcare services and resources, and poverty — all of which disproportionately put Indigenous communities at risk.

Many northern communities in Canada are accessible only by airplane, boat and barge, and by winter roads only after freeze-up (Skinner et al. 2013). Ice roads, ferries, and barges are affected by severe climatic changes (Beaumier and Ford, 2010; Blom et al. 2022), thereby compounding the food insecurity challenges. These transportation modes are vulnerable to weather fluctuation and climate change (Beaumier and Ford 2010; Thompson, Bonnycastle, and Hill 2020). With climate change, the winter road season is increasingly shorter and more dangerous, with the Northwest Company transport manager complaining: “Over a journey that long, there are challenges from weather or traffic accidents — but the most problematic is the river crossings” (Brend 2022). Climate change thus compounds food security challenges for no-road-access communities.

Table 1. Provincial and territorial zones (categories) of remoteness for FN and Inuit communities and population data for no-road-access communities.

Province/ Territory	Growth rate (%) 2006-2016	Number of FN and Inuit Communities	% Communities Per Zone			No Road Access		Median Income*	LIMAT for NCC*
			Urban	Rural	Remote	Special Access	Population		
Alberta (Fort Chipewyan)	22.2	47	44.7	48.9	0.0	6.4	10,832	\$27,600	39
British Columbia	11.9	201	39.3	38.8	6.0	15.9	31,075	NA	NA
Manitoba	9.5	63	7.9	63.5	1.6	27.0	34,827	\$20,828	38
New Brunswick	1.5	15	66.7	33.3	0.0	0.0	0	NA	NA
Newfoundland and Labrador	2.3	4	50.0	25.0	0.0	25.0	1,111	\$36,960	18
Nova Scotia	0.6	13	69.2	30.8	0.0	0.0	0	NA	NA
Ontario	10.6	139	31.7	43.2	0.7	24.5	46,469	\$25,686	37
Prince Edward Island	4.1	2	50.0	50.0	0.0	0.0	0	NA	NA
Quebec and Nunavik	7.1	41	43.9	26.8	14.6	14.6	7,396	\$36,575	16
Saskatchewan	12.2	70	14.3	78.6	2.9	4.3	6,412		Missing
Northwest Territories	0.2	27	25.9	22.2	3.7	48.1	6,313	\$33,539	15
Yukon (Old Crow)	16.3	16	12.5	50.0	31.3	6.3	604	\$32,787	15
Nunavut*	1.2*	24	0	0	0	100	48,981	\$36,575	18

Definitions:

Urban: within 50 km of the nearest service centre with year-round road access.

Rural: within 50 and 350 km of the nearest service centre with year-round road access.

Remote: over 350 km from the nearest service centre by year-round road access.

No road access, called special access by the Canadian government: no year-round road access to a service centre, resulting in a higher cost of transportation.

*2021 statistics for median individual income for an average of Nutrition North Canada (NNC) communities, LIMAT for NNC communities and Nunavut's population change from 2016 to 2021

These four categories of remoteness are defined in Table 1 (Indigenous Services Canada 2022). Almost two hundred thousand (194,020) people in Canada reside in communities without road access, with most communities in Manitoba, Ontario and Nunavut. Poverty rates are much higher in Indigenous communities without road access, with a median income of \$20,828 in Manitoba (38 per cent low-income people measured by the low-income measure after tax (LIMAT)), \$25,686 in Ontario (37 per cent LIMAT) and \$27,600 in Old Crow, Alberta (39 per cent LIMAT). Manitoba's communities without road access are economically poorer, at half the Canadian median income of \$41,200, and their proportion of low-income people is 3.5 times that of Canada's off-reserve population. Other provinces have slightly higher incomes, with LIMAT between 15 to 18 per cent, according to the available income data from Statistics Canada (2021). Saskatchewan and some communities

lacking road access in Manitoba are missing income data due to the COVID-19 lockdowns that prohibited travel to or around the community in 2020. Nutrition North Canada (NNC) also does not include the roadless island communities on the Pacific coast in British Columbia that need subsidies due to higher food prices.

More than distance, the lack of road access defined food and water access for Shoal Lake First Nation 40. The community was cut off from a road by a pipeline that supplied the City of Winnipeg with safe drinking water. Without road access, Shoal Lake 40 lacked safe drinking water or access to healthy food, even though it is located only a few kilometres from Kenora, Ontario and lies within 100 km of Winnipeg. Although Shoal Lake has been providing Winnipeg's drinking water since 1919, road construction did not materialize until one hundred years later, after many protests and campaigns for road access. The lack of commitment and funding for roads to Shoal Lake First Nation 40, after their forced displacement by a water utility corridor to Winnipeg settlers, exemplifies colonial capitalism and the resource curse on First Nations communities. A resource curse is defined by Havranek, Horvath, and Zeynalov (2016) as the negative impact on communities of abundant resources that provide few or no benefits. The resource curse is also called the "paradox of plenty" and the "poverty paradox".

The resource curse befalls Indigenous communities where rich resources from Native lands are taken for corporate or settler benefit, forsaking Indigenous basic needs. Franch-Pardo et al. (2017) explain that the extractive interests of abundant natural resources maximize the capitalist benefit to define remoteness as: "high levels of social inequality, and marginalization, widespread corruption, and large geographic areas." The resource curse for Indigenous communities was effectively written into the Indian Act. The Indian Act continues to exert colonial power over Canada for settler benefits from northern resources (Gohain 2019; Kuhnlein and Receveur 1996; Turner et al. 2013a; Whyte 2015). All Crown land and resources in Canada fall under its trust laws.

Indigenous people were segregated from urban communities into rural, remote and isolated places through the Indian Act. Section 49a enforced the removal of Indian reserves from towns and cities to segregate these Indian reserves in remote areas stating that "an Indian reserve which adjoins or is situated wholly or partly within an incorporated town or city having a population of not less than eight thousand" could be removed without the population's consent in matters "having regard to the interest of the public" (Indian Act 1911, s. 49a). For example, a small group of Dakota Oyate did not sign any treaty with the Crown and instead purchased fee-simple or freehold land in the town of Portage la Prairie, Manitoba, where their farms and other businesses prospered. Then, in 1911, the Crown used the Indian Act to economically sanction and relocate this Dakota group to an Indian reserve far away from urban areas, usurping the land they bought deeds for (Blacksmith et al. 2021). To this day, the colonial agenda remains intact in the Indian Act. Colonial policies forced the displacement of Indigenous people from their Native lands and undermined their economies, governance, food systems, environmental stewardship, spiritual practices, education systems and traditions (Blacksmith et al. 2021; Domingo et al. 2020).

Another measure of isolation is food quality and price. Canada's colonial "fix" for food insecurity in communities lacking access roads was a subsidy program applied to 122 colonial for-profit stores. The federal program, called Nutrition North Canada (NNC),

is reported to have little or negative impact on food security and exorbitant food costs. St-Germain et al. (2019) documents food security rates of 33 per cent before NNC in 2010, 39 per cent during implementation in 2011 and 47 per cent in 2014, after implementation. Despite subsidies from NNC, food costs rose, and food security worsened. Racism and colonialism are implicated in higher charges for 75 per cent of the food items surveyed at Opaskwayak Cree Nation than in neighbouring The Pas (a non-First Nation town) (Wendimu et al. 2018).

The NNC prices for the northern food basket for each Indigenous community lacking road access are available on the program's website. The northern food basket is not directly comparable to the nutritious food basket, providing lower quantity and nutritional quality of food; it weighs one tenth less than the nutritious food basket, and contains processed, less nutritious foods (Zahuruk 2014). The average northern food basket price for all 122 communities is \$419/week, while a nutritious food basket costs \$265/week (Thunder Bay Health 2021). The highest northern food basket price is \$503/week in Nain, located about 370 km (230 mi) by air from Happy Valley-Goose Bay in Labrador, followed by \$487/week in Norman Wells, NWT. Both industrial towns, Happy Valley-Goose Bay has Voisey's Bay Mine, the Lower Churchill Hydroelectric Generation Project, and forestry, and Norman Wells has had a century of oil production, supplying the American pipeline grid in northern Alberta (Lamberink 2022). Norman Wells' high food prices and lack of road access, despite its receipt of the NNC subsidy in 2021, show that utility corridors do not provide more affordable food access and food security. Although incomes are comparatively high for mining and administrative workers, this advantage typically excludes females and Indigenous people. Oil revenues from Imperial Oil and a pipeline on Sahtu Native land were channelled through the Indian Agent, who was legally the Sahtu trustee for the land and resource revenues (Lamberink 2022), while the negative impacts to Native lands, i.e., spills, massive waste disposal and environmental pollution remain with the First Nations communities there.

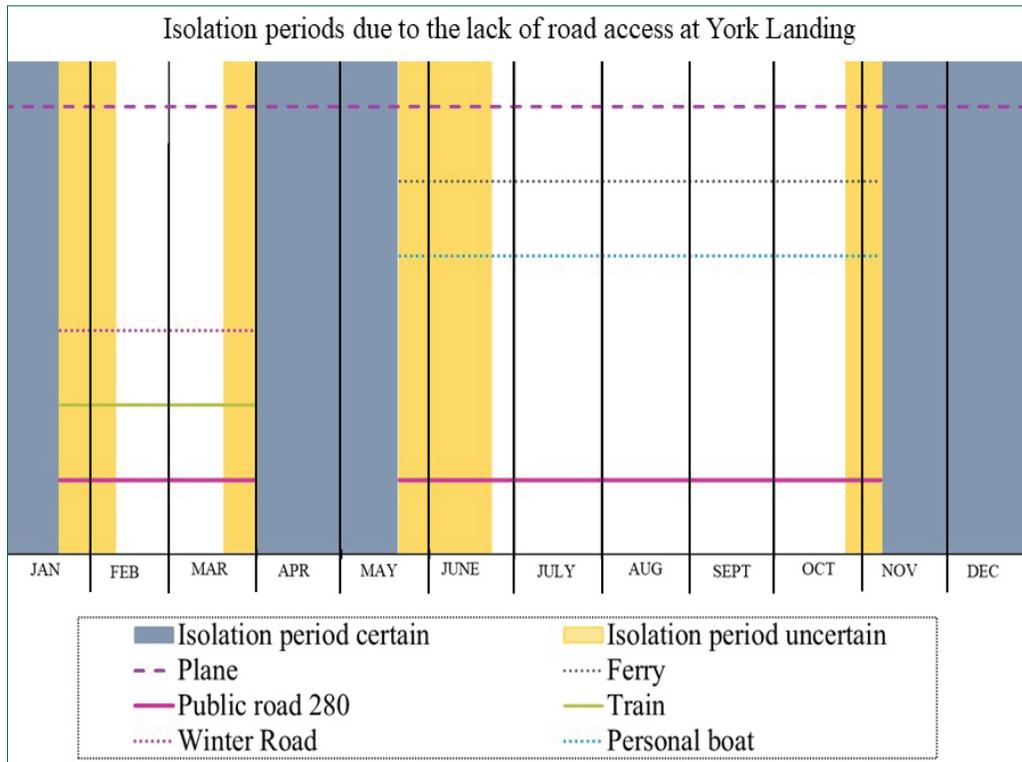
4.1 HOW PEOPLE IN COMMUNITIES EXPERIENCE NO ROAD ACCESS:

Two case studies of two different First Nations without road access show how people experience food insecurity and marginalization at York Factory First Nation (YFFN) and Wasagamack.

4.1.1 York Factory First Nation Case Study: No Access Road Despite Northern Corridor Politics

York Factory First Nation (YFFN) in northern Manitoba lacks an access road. When its ferry blew up in April 2022, a state of emergency was announced and lasted until the end of August. Ferry service had a history of being highly unreliable prior to the blow-up and unusable between fall freeze-up and spring ice melt, creating the isolation periods shown in Figure 2. Being unreliable due to breakdowns, weather, staff problems and fluctuating water levels from hydro dams, ferry services cannot replace a road even in the best of times.

Figure 2. Isolation periods due to the lack of road access at York Landing



Adapted from York Factory First Nation 2021, 5.

For more than twenty years before 2000, every elected YFFN Chief and Council lobbied for an access road. SNC Lavalin Engineering with Manitoba Infrastructure identified the winter road route as an all-season access road to York Landing in 2015, which lines up with what YFFN wants in order to deal with food insecurity:

An all-season road is needed to reduce the challenges currently experienced by York Landing residents in regard to accessing healthy and affordable store-bought foods. An all-season road would eliminate isolation periods and the associated issues and would allow the local Northern Store to bring in groceries at a lower cost for community members (York Factory First Nation 2021, 14).

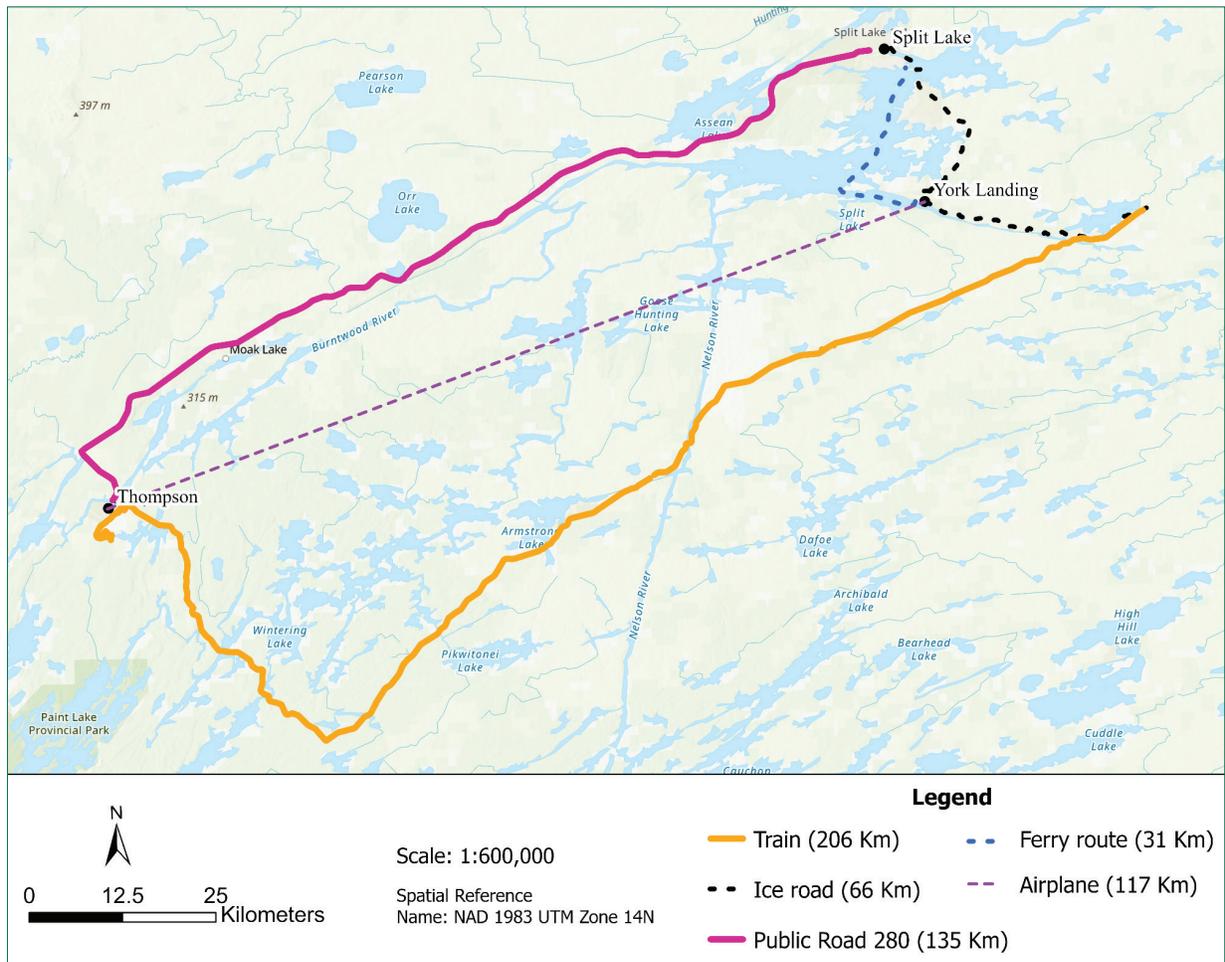
The YFFN declared a state of emergency in 2022. This emergency state was a response to the great hardships from the lack of access to healthy food, banks, dentists and hospitals when the ice road closed in March 2022 and remained closed until mid-August. The members of YFFN demanded a lifeline to health, food, emergency services and building supplies, rather than the limited, risky access when the ferry works.

Even when the ferry works, their travel options are challenging, time-consuming, physically demanding (as shown in Figure 3) and unaffordable, with the following costs:

- For airfare: \$800/person/air trip for next-day return airfares (\$512 to \$655), requiring freight (\$65), taxis (\$40) and hotel (\$190/night); no same-day service options (YFFN, 2021).
- For ferry/vehicle travel: \$550/boat travel with \$250 to hire a boat and \$300 for a car taxi from York Landing to Thompson in 2020.

- For ice roads with a personal vehicle: \$250/car while risking their lives on rough, dangerous ice roads at the current mileage cost of \$0.61 /km (Canada Revenue Agency, 2022). People often have to wait for a snowstorm to pass and a plough to clear the winter roads before embarking on a journey. This situation has resulted in the loss of lives due to the winter ice road buckling, with vehicles falling into the icy water.

Figure 3. Travel routes from York Landing to access Thompson service centre



Adapted from York Factory First Nation 2021, 7.

Without a ferry or a road, food transportation costs skyrocketed in the summer of 2021, adding 40 per cent to food and water costs. Safe drinking water was needed due to water cistern shortages, and water plant breakdowns raised the price of a case of twenty-four small water bottles by 42 per cent from \$17.99 in May 2021 to \$25.49 in July 2022. Food prices in York Landing were already high, with a food basket costing \$403.65/week in March 2021, despite the open winter roads and a subsidy in effect (Nutrition North Canada 2022). Chief Wastesicoot draws a link between the lack of healthy food and the high rates of mental health and chronic diseases at YFFN (Wastesicoot 2022).

Healthy food is too expensive for many YFFN families, with 28 per cent of YFFN adults below the LIMAT), 2.5 times the Canadian rate of 11 per cent (Statistics Canada 2021). The community of 455 residents (Statistics Canada 2021) has a median income of \$27,600, compared to \$41,200 for Canada overall. This income is higher than many First Nations in northern Manitoba, due to construction jobs with Manitoba Hydro at the Keeyask Generating station (Statistics Canada 2021), but lower than the provincial average and not high enough to afford food prices this high.

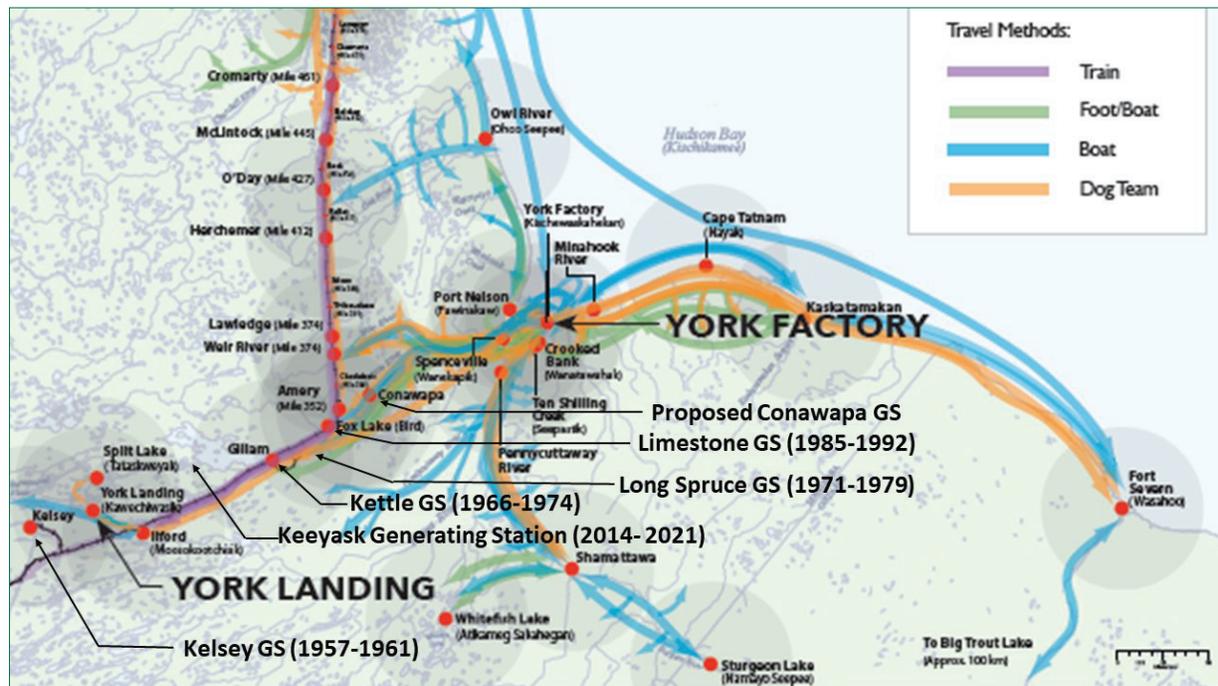
Traditional food is not an alternative to the stores' high prices at YFFN due to the lack of nearby traditional territory to hunt from, resulting from the YFFN forced displacement. Before being forcibly relocated from their Native land along Hudson Bay, the YFFN could provide their families with healthy traditional foods from the abundant intertidal areas (York Factory First Nation 2021). The colonial government forced the Ininew from their homes and territory near York Factory to York Landing. Without any territorial land or traplines nearby, Ininew were removed from their traditional harvesting sites to a swamp on the mighty Nelson River with nothing — no school, no transportation and no houses.

Getting to their traditional territory via the Nelson River by boat is hazardous due to the changing water flow from the hydro dams. Helicopters and special, large boats are needed to get there, which is unaffordable. According to YFFN (2021, 18):

Single-parent households, especially single mothers, are disproportionately impacted by the high costs of harvesting wild foods. These intergenerational impacts and associated costs have prevented and discouraged many members from accessing healthy wild foods that were once the main source of sustenance. A once food sovereign community is now reliant on store-bought foods imported at great expense.

Dispossession increases Indigenous people's vulnerability to poor health, food insecurity, acculturation and decline in general wellbeing at the community level (Tobias and Richmond 2014; Gillies et al. 2020; Andrade-Rivas et al. 2022; Priadka et al. 2022; Thompson and Suzuki, 2022). Surrounded by hydro dams at York Landing, YFFN suffers massive impacts from hydro development, yet still lacks a road and other basic infrastructure. YFFN reports that its population's health is badly impacted by the current development approach, without reliable access to health care and many barriers to harvesting wild foods or other healthy food (York Factory First Nation 2021).

Figure 4. Hydroelectric dams impact on York Landing for York Factory First Nation.



Adapted from York Factory First Nation 2021, 11.

The YFFN people continue to experience economic and infrastructure poverty despite partnering on massive industrial development. The YFFN is without access roads or a hospital and has high food insecurity despite its co-ownership of the Keyask hydro generating station. Figure 4 illustrates how YFFN is located between and highly impacted by Kelsey and Keyask generating stations. YFFN voted to take on the debt required for a limited partnership to own five per cent of the Keyask generating station. The community voted yes despite YFFN Elders stating that the “Keyask Project is inherently inconsistent with our Customary Laws and our obligations to protect Mother Earth” and that “we experience the irreversible social, cultural, spiritual and environmental impacts of Manitoba Hydro’s previous developments on the Lower Nelson River every single day” (York Factory First Nation n.d.). Despite some training funding, service contracts and employment under the Burntwood-Nelson Agreement, containing a “northern preference clause,” YFFN youth and women lack employment and education opportunities, with lower incomes and double the poverty rates experienced by residents of Manitoba and Canada. As a result, YFFN is seeking innovative partnerships for a northern corridor to reduce youth malaise and improve health by gaining bargaining power, which did not result from the partnering on hydro development.

Fox Lake, York Factory and many other First Nations are proposing a NeeStaNan northern corridor through their territories to Port Nelson to gain political power, build access roads and control northern development (NeeStaNan 2022). However, YFFN recognizes that a corridor to move resources is a different project from an access road for servicing their community. Chief Daryl Wastesicoot (2022) stated that the NeeStaNan corridor would not happen without an access road to decrease food costs and health issues for YFFN:

“no corridor prior to getting an access road for their community in York Landing.” However, this NeeStaNan corridor drastically varies from the notional northern corridor, which does not run through YFFN territory to Port Nelson. The route to Churchill, rather than to Port Nelson, cuts through the Indigenous-led protected area in the Seal River Watershed, which would undermine their conservation initiative proposal for a federally funded protected area (Seal River Watershed Alliance 2022). The notional northern corridor through this watershed erects a barrier to the migration of the threatened caribou, which risks the caribou’s survival there. Food security and cultural integrity of those First Nations dependent on caribou are also threatened.

4.1.2 Wasagamack First Nation Case Study: Airport Not Road Wanted

For the people of Wasagamack, a remote northern Manitoba First Nation, a small boat, not a road ferry, or airport, is the only way in or out for most of the year. Wasagamack residents must take a twenty-minute boat ride through choppy waters to St. Theresa Point Airport to catch a plane to a service centre. A flight of 610 km (380 mi) takes 1.5 hours, costing \$1,000 or more for the return ticket plus \$60 for the boat ride/person. During freeze-up and break-up, getting to the airport requires a helicopter, costing as much as \$800 one-way on top of the plane fare. A road connection to an urban centre or other Island Lake reserves is not expected to be available until 2050.

“Lives cost so much in Wasagamack” Wasagamack elder Solomon Wood told an interviewer (Barghout 2017), referring to the fact that Wasagamack’s lack of airport costs human lives as well as lots of money to travel. Solomon explained that Wasagamack has been campaigning for an airport for fifty years: “It’s been a long time that we’ve been asking for an airport for our community safety” (Barghout 2017). Chief Alex McDougall explained how an airport was a medical necessity to save lives: “Having a serious medical incident, we can’t simply just take them to the airport, and they are airlifted to Winnipeg. We must wait for daylight to do that because you can’t simply just cross the lake to do it. The benefits outweigh the costs of building this airport for our members” (Caruk 2017).

The colonial governments declined Wasagamack’s request for an airport. Transportation decisions are complicated, as provincial approval is required before the federal government considers a project: requests for access roads must be “first prioritized by the provincial government, who submit a funding application to the federal government” (Caruk 2017). The provincial government vetoed Wasagamack’s bid for an airport, promising a 28 km road to St. Theresa Point without access to a service centre. Five years later, in 2022, no road had been started.

Another access hardship is needing to take a boat to the grocery store. The Northern Store is located on an island, requiring an \$8 boat ride to buy groceries. In 2022, media (APTN by Hobson 2021) showed residents from Wasagamack falling through the ice getting groceries during the spring break-up. For most of the year, going to a hospital, bank, restaurant or postsecondary facility requires Wasagamack First Nation community members to take a boat and an airplane, which is expensive, time-consuming and physically taxing.

Economic and infrastructure poverty impacts people every day, limiting their food and other life choices. During COVID-19, food insecurity in this community was 100 per cent

in 2020 (Oni 2021), rising from 79 per cent in 2010 (Zahariuk 2014). No funds from charities or the colonial government are available for food banks or community food centres to prevent hunger, with food banks rare in First Nations communities. This is all the more difficult to understand since most people in Wasagamack live in economic poverty, with a median income of \$15,500 (Statistics Canada 2021), roughly one-third of the median income of \$41,200 overall for Canada (Statistics Canada 2021). The LIMAT of poverty in Wasagamack is 52 per cent, five times higher than the Canadian rate of 11 per cent. The 2,088 Anishinew (Statistics Canada 2021) face many other deprivations, e.g., overcrowded housing, with five people in the average household compared to 2.4 people on average for Canada (Statistics Canada 2021).

Cultural and ecological integrity endure in Wasagamack, despite Canada's brutal colonial rule (Statistics Canada 2021; Thompson, Harper, and Whiteway, 2019). The community's remoteness and culture have given Wasagamack a unique history. Almost all Anishinew speak their language fluently. Indigenous food system practices and traditional land uses are enduring, since Island Lake and the Hayes Watershed have few settlers, no dams and no industrial development. Traditional land-use map biographies chronicle how Anishinew continues to harvest, steward and conduct ceremonies on their extensive territory. This sacred communion with the land and animals ensures that wild food is harvested sustainably in a way that nourishes the Natives. Elders who did not go to residential schools continue to animate Indigenous knowledge systems and encourage wild food pursuits, although many Elders who grew up on the land have died of old age (Thompson, Harper, and Whiteway 2019).

Despite economic poverty and lack of community infrastructure, all forty-eight Wasagamack people interviewed rejected industrial development that would change their land. Each saw the land as perfect the way the creator made it (Thompson, Harper, and Whiteway 2019). Wasagamack people reject the dominant model of development that has wreaked havoc on ecosystems and Indigenous cultures worldwide (Thompson, Harper, and Whiteway 2019). The Anishinew view community-led development as the solution to food security and poverty reduction. A community-led development approach prioritizes Indigenous food sovereignty, on-the-land education called *nopimink*, and community-led, project-based education and infrastructure. It also focuses on adequate housing and a community airport to bring reconciliation, renewal and healing from the effects of residential schools and other colonial policies. Community-led development, not industrial development, is what the Anishinew feel will feed people and bring wellbeing in the short, medium and long term.

CASE STUDY CONCLUSION

In summary, Indigenous communities in Canada are not only geographically remote but also politically remote (Caruk 2017). Their marginalization results in high food prices, lack of basic infrastructure, lower incomes and limited or no control over development, despite their right to be consulted. The federal and provincial governments team up to fund pipelines, corridor roads, hydro development and airports based on colonial policies and not on Indigenous people's wellbeing. Engaging the Indigenous majority population of Northern Canada only after the School of Public Policy's proposal of a notional northern corridor route to Churchill exemplifies the differences in routing development depending

on the sequence of involvement. NeeStaNan, the Indigenous-proposed route leading to port Nelson, Manitoba, varies starkly from the first proposal, creating tensions and showing the need for partnering with Indigenous communities.

This different route has created tensions and shows the need for partnering with Indigenous communities or ideally Indigenous-led development in Northern Canada. Although Denenedeh Investments Incorporated, representing twenty-seven Dene First Nations, supports the research as a partner for the Yukon segment of the notional northern corridor, for most of Northern Canada, where this northern corridor traverses, the many First Nation and Inuit communities and organizations were not brought in as partners at the concept or the notional stage.

The Canadian Northern Corridor (CNC) held engagement sessions from January to July 2022, creating preliminary conversations with Indigenous and non-Indigenous communities across Northern and mid-Canada to discuss the CNC benefits and costs based on the Northern Corridor (Canadian Northern Corridor Engagement 2022). These engagements are considered preliminary, with more dialogue needed (Hill 2022). The Northern Corridor engagements are not to be confused with consultation, which is a prescribed government process.

Despite settlers benefiting from the resource abundance (oil, drinking water, hydro) on Native lands, Indigenous people's needs for food, water and roads have gone unmet. The example of YFFN is not singular, and is repeated at Shoal Lake 40, which has provided Winnipeg with safe water while lacking safe tap water and access roads for one hundred years. In the case of Wasagamack, colonial access policies provide subsidies to for-profit food stores and airports on separate Provincial Crown islands at the expense of people who pay a high price and risk their lives to access costly food and other essential services.

Colonial governments, not Indigenous governments, decide northern and Indigenous development. Provincial politics decided against the request for funding an airport at Wasagamack, despite a fire in 2019 that required an airport for escape, and despite promising a local road that has not been built. At God's Lake, the province agreed to build an access road, but provided a longer route through Norway House, involving ferry service, rather than the shorter and more reliable one through Pimicikamak, preferred by God's Lake. The route was chosen not based on First Nations' interests, but on mining and colonial interests, to prevent Pimicikamak's agency after residents occupied JenPeg to protest the Northern Flood Agreement's lack of compensation. Similarly, the proposed Northern Corridor route runs through the port of Churchill, which would undermine the Indigenous-led protected area in the Seal River Watershed, rather than Port Nelson, as proposed by YFFN and other First Nations proposed for the NeeStaNan corridor. Today's decisions will impact Indigenous communities for generations to come, and should better reflect their interests.

5.0 NORTHERN CORRIDOR IMPACTS

Does a northern corridor mitigate the issues causing food insecurity in Northern Canada? A “Canadian Northern Corridor: Exploring Northern Pathways to a Connected Canada” is designed to transport Canadian resources to global and interregional markets connecting East to West, North to South and the Arctic. The Northern Corridor is expected to include the construction of roads, railways, transmission lines (electrical power), northern ocean ports and pipelines (water, hydrogen, oil, etc.) and to align with natural resource interests (mines and forestry) for shipping through ocean ports. The stated objectives of a northern corridor are to establish a right-of-way with sufficient room for road, rail, pipelines and transmission lines (Sulzenko and Fellows 2016), to lower trade costs, increase gross domestic product (Fellows and Tombe 2018), and optimize and increase the export of resources and agricultural goods (Fellows and Tombe 2018, Tombe, Munzur, and Fellows 2021). The northern corridor has the declared goal of connecting various Indigenous communities with access roads, resources and better telecommunication services. However, the mapping of the notional corridor tells a different story.

Figure 5 shows the notional northern corridor, which is not the final version but is illustrative of the assumptions and goals of the project. The concept shows six different ports, to ship and receive resources globally. Figures 6 and 7 illustrate the thinking behind the route to reveal whether servicing Indigenous communities without road access was considered or whether accessing resources in Crown areas or Indigenous resource areas is the priority.

Figure 6 shows that as currently envisioned, the northern corridor does not connect with any Inuit communities in Nunavut, Nunavik or Labrador. Its route is within 25 km of only seven no-road-access First Nation communities. Thus, the notional corridor does not offer road access or two-way resource trade with the Inuit peoples of Canada or most First Nation communities lacking road access. This finding resulted from mapping the list of communities without road access compiled from the government’s First Nations Profiles. The seven First Nations communities located within a 25 km range of the notional northern corridor include three Island Lake Anishinew communities (MB), Cat Lake First Nation (ON), North Spirit Lake (ON), Takla Nation (BC) and Pehdzeh Ki First Nation (NWT).

Figure 6 shows that this notional route does not connect to many communities without road access. Also, it does not align with the NeeStaNaN Indigenous-led corridor route, but rather cuts into the proposed Indigenous-led protected area in the Seal River Watershed and the proposed Indigenous-led protected area in Island Lake. The NeeStaNaN corridor, backed by YFFN, has proposed a different route, leading from the tar sands and potash to Port Nelson. However, YFFN acknowledges that its resource corridor is not about road access for the community but about jobs and increasing bargaining power to get access roads by making this a conditional requirement of the corridor.

Figure 5. Notional northern corridor with winter roads as published by Statistics Canada (2022) and permafrost layers (Permafrost, Atlas of Canada, 5th Edition).

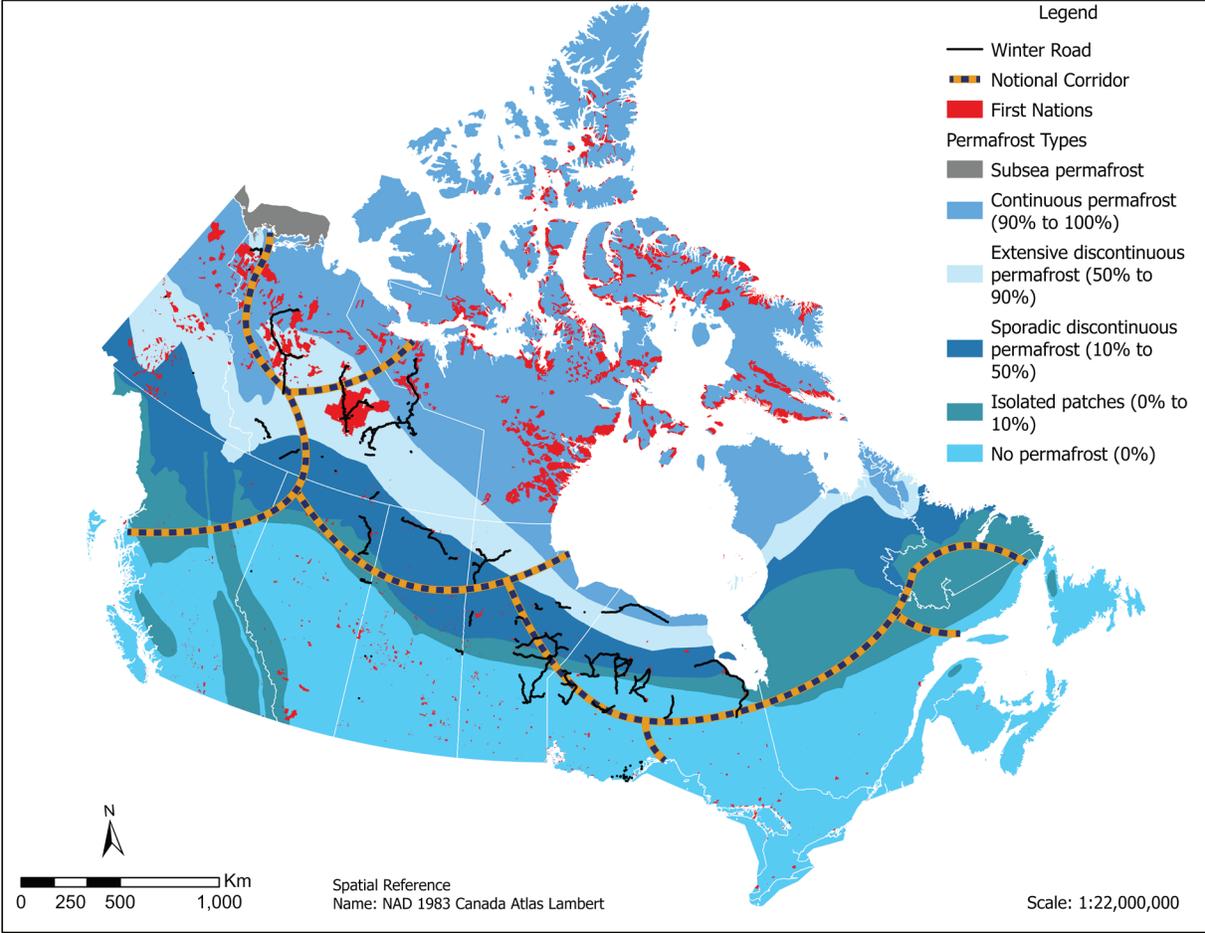


Figure 7. Greenstone belts, First Nation reserves, Inuit communities and roads juxtaposed with the notional northern corridor route.

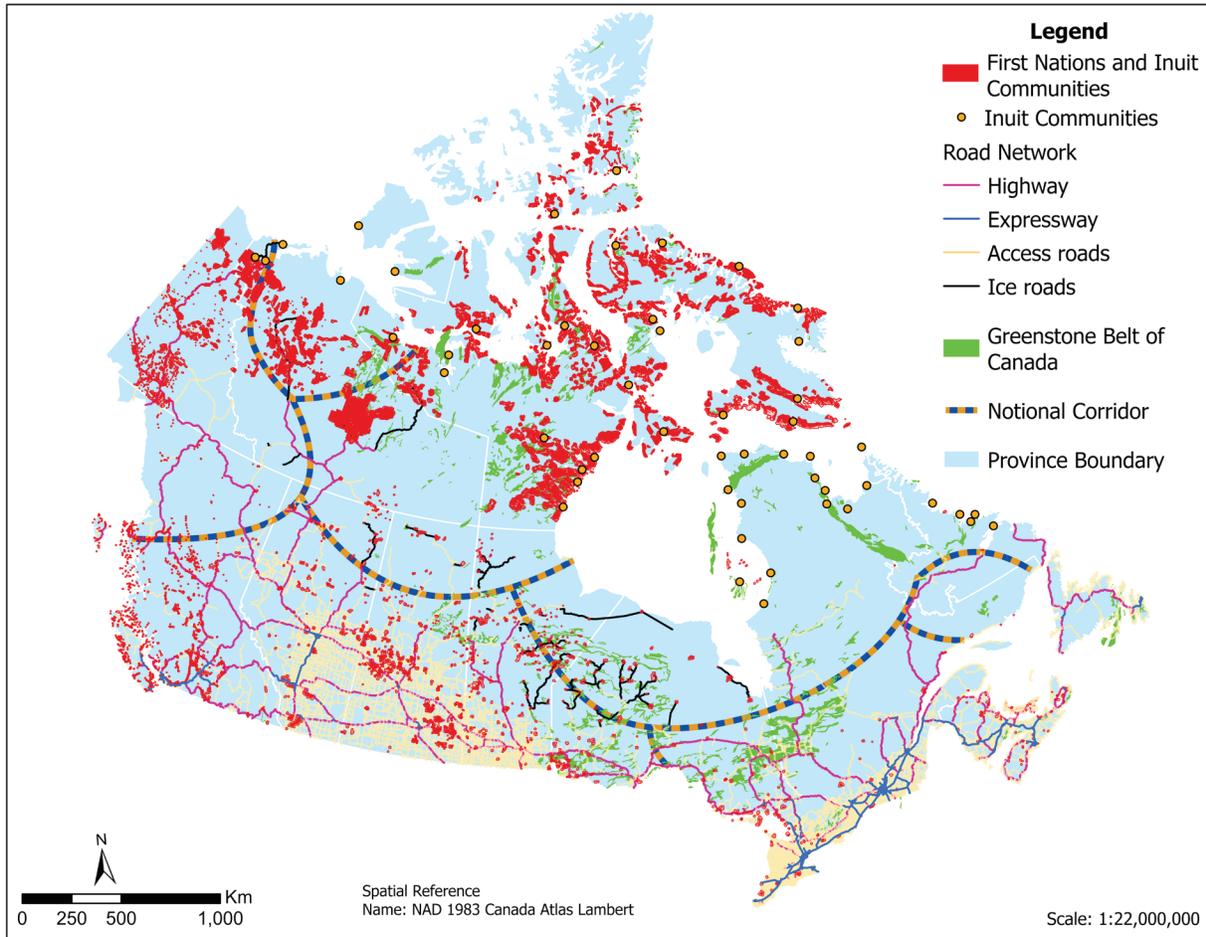


Figure 7 reveals that the notional northern corridor route is geared toward non-renewable resource extraction. The notional route travels through the potash and uranium mines in Saskatchewan, greenstone belts and lithium deposits in the Ring of Fire, Yukon and Manitoba, as well as to oil/mineral deposits in Alberta and the Yukon. Figure 7 shows the notional corridor's spatial proximity to mineral and other deposits within Canada's greenstone belts, which often contain gold, silver, copper, zinc, lithium, iron, lead and possibly other rare earth metals.

The cited potential impacts of the Northern Corridor include economic benefits for Indigenous communities in terms of lower energy costs due to grid connections and gas supply, lower cost of living where road and rail access becomes available, and jobs (Sulzenko and Fellows 2016). However, the notional corridor joins existing road and rail corridors only in Quebec, Manitoba, Alberta and British Columbia (Sulzenko and Fellows 2016), without any mention of including access roads to Indigenous communities within a specified range — a prerequisite for improved access to food, employment, education and health care.

Infrastructure for the benefit of Indigenous communities has not resulted from utility or resource corridors in Canada. “Piecemeal” funding and governance have been an ongoing problem of northern infrastructure projects (Fellows et al. 2020, p.1). Resource extraction and corridors from Shoal Lake 40 and Norman Wells did not bring roads for over one hundred years after pipelines were constructed to both. These resource corridors undermined access to traditional lands and food security without providing road access or access to market foods. If pipelines and utility corridors were a panacea for food security, then Alberta, with its 33,032 km of regulated pipeline, would not have the highest rates of food insecurity of Canada’s provinces at 60 per cent (Chan et al. 2021, Canada Energy Regulator 2022). Similarly, “clean energy” has resulted in few benefits to Indigenous communities, as shown by the massive negative impacts hydro development has had on York Landing, without providing access roads, food security or reduced food prices (York Factory First Nation 2021). How to finance roads and transmission lines to communities outside the range and context of revenue-generating resource transport remains a question.

Could Indigenous people receive revenue from the utility corridor development and control its impacts? Under the Indian Act, First Nations are legal wards of the Crown, which is why Norman Wells’ dealings were between Imperial Oil and the Sahtu Indian Act trustee, Indigenous Affairs (previously called Indigenous and Northern Affairs Canada). The trustee collected the oil royalties without building roads or infrastructure or ensuring adequate pollution control (Caruk 2017). At Norman Wells, resource regulations will shift with the final Self-Government Framework Agreement currently negotiated based on the Sahtu Dene and Métis Comprehensive Land Claim Agreement (2007). However, self-government is rare, with only twenty-five agreements for forty-three Indigenous communities, and fifty agreements on the negotiation table. Negotiations take time and will probably have little bearing on Norman Wells Imperial Oil’s plant, pipeline, and closure plan, which will remain under federal jurisdiction, as oil and pipelines are a matter of the Canadian Energy Regulator.

The Government of Canada explains that the Indian Act seizes control over Native land from Indigenous people:

Administrative control and legislative authority are, however, vested exclusively in the Government and the Parliament of Canada. It is a trust. As long as this trust exists, the Government, as a trustee, must supervise the business connected with the land. The result of Crown ownership and the Indian Act has been to tie the Indian people to a land system that lacks flexibility and inhibits development (Government of Canada 1969, 11).

5.1 IMPACT ASSESSMENT

Utility corridors running across the northern provinces and into the Yukon will create habitat fragmentation and block migration over a large area, putting threatened species at further risk. For example, the route of the notional corridor cuts through a proposed Indigenous-led protected area for ecological and cultural integrity (Seal River Watershed Alliance 2022), with at least twenty-two known species at risk — including wolverines, polar bears, grizzly bears, caribou, killer whales, lake sturgeon and olive-sided flycatchers, among over 260 identified mammal, aquatic, bird, plant and insect species (Seal River Watershed Alliance 2022). This Indigenous-led protected area is being led by two Dene and two Ininew

First Nations, which depend on caribou for food security. This notional corridor route would impact the migration of barren-ground caribou from Canada's Arctic to this Dene and Inineu area and the Woodland caribou along their northern range. The woodland caribou are threatened under the federal Species at Risk Act, because of habitat loss, habitat fragmentation and alteration (Committee on the Status of Endangered Wildlife in Canada 2022). Also, three thousand beluga whales breed and calve in the Seal River estuary and would potentially be impacted.

Utility corridors enable other development. They require extractive industries and pipelines, which will destroy natural habitats, and cause environmental pollution, biodiversity loss and decimation of wildlife (Findlay and Bourdages 2000; Environment and Climate Change Canada 2022). New mines are expected to be built in Ontario's Ring of Fire, Manitoba's greenstone belts, the bitumen tar sands and the potash mines of northern Saskatchewan, enabled by the northern corridor route opening up this area (Impact Assessment Agency of Canada 2022). Indigenous people are impacted by this unwanted industrial and settler development regulated by colonial governments. Ironically, colonial governments also control regulation and impact assessment procedures for colonial development programs and projects.

Canada's impact assessment process weighs resource development and infrastructure benefits against its negative health, socio-cultural, economic and environmental impacts, considering mitigation (Impact Assessment Agency of Canada 2022). The process is criticized for being a pro-development rubber stamp of project approval that infringes on constitutionally protected Indigenous rights of consultation (Arsenault et al. 2018). According to Arsenault et al. (2018), Canada's assessment process typifies a neoliberal system whereby capitalism, economic interests and colonial objectives endorse environmental degradation and resource depletion. The industry's control over the assessment process allows industrial proponents with recurrent adverse impacts to perform the studies required to approve projects in Indigenous communities. This *modus operandi* fosters mistrust in the process (Arsenault et al. 2018).

Insights into some potential impacts of a northern corridor are gleaned from impact assessment reports for roads and mines (Impact Assessment Agency of Canada 2022). A local road to connect communities was assessed against a road to service centres. Road impacts vary with their type (local, access, highway) and location. An all-season access road from Berens River to service centres is compared to a local road between the Native communities Inuvik and Tuktoyaktuk (Impact Assessment Agency of Canada 2022). The local road lists minimal habitat and pollution impact of the road surface, gravel pit mining, gravel grading and vehicle exhaust. Connecting two nearby small populations allows people easier access to local harvesting of traditional foods, sharing food and practicing culture, language and spirituality on the land. Road access to service centres results in different impacts. Road access provides cheaper food, materials and services for those with cars to improve food security, health and education. However, road access also provides easier access for industry, gangs, drugs and loss of culture.

Two mining projects in Canada's North were reviewed to explore the potential impacts of the Northern Corridor opening roadless land to extractive industries — a lithium mine at Whabouchi Mining Project, QC and a gold mine at Bluejack, BC (Impact Assessment

Agency of Canada 2022). In general, mining projects involve utility corridors, access roads, transfer stations and site preparation, including draining of lakes, flying skilled workers in and tailing ponds. The potential negative impacts of mining include interfering with Indigenous rights regarding fishing, hunting, and trapping and cultural, educational, and economic aspects and sites; and affecting culturally important activities, ceremonies and local language. Encroachment onto traplines, cultural and spiritual sites impacts fishing/ice fishing, furbearer trapping, big game and goose hunting, berry picking, logging and medicinal plant harvesting. Travel over portages and on snowmobile trails and navigation on water can be disrupted (Impact Assessment Agency of Canada 2022).

Mining affects the quality of water and land, their quantity and any sustainable development of their resources (Impact Assessment Agency of Canada 2022). Mining impacts watersheds during site preparation, and mine development is associated with heavy water usage, causing groundwater drawdown and impacting surrounding wetlands. Mining changes the water quality through sediment loading, erosion of suspended solids, acid mine drainage and metal leaching, including of radioactive metals such as uranium. Mining also impacts breeding habitats and reduces the abundance of culturally valuable species. Changes in terrestrial and wetland environments alter landscapes, upset ecosystem dynamics, reduce biodiversity and diminish the abundance of species at all levels of the food web, including species at risk (Zerrieffi, Reyes, and Maloney 2022; Impact Assessment Agency of Canada 2022).

Mining development and operations directly impact human health by negatively impacting freshwater bodies and land availability for traditional food production and harvesting (Impact Assessment Agency of Canada 2022). Mining operations and their heavy equipment contribute to noise pollution, particulate matter and gaseous emissions (NO₂, SO₂, CO₂), which lower air quality. Potential spills from mining operations pose safety and health challenges to humans. Traditional food availability and acceptability are frequently altered. Opportunities for Indigenous knowledge sharing and community interactions diminish due to habitat destruction and land-use changes from mining-related construction, expansion and upgrade operations. Mines also result in an increasing loss of traditional food choices. An inability to maintain food sustenance undermines Indigenous food sovereignty and leads to a continual decrease in food security. Mining also creates inequity between genders, by employing mainly settler males, which has resulted in gender violence toward Indigenous women. The potential benefits of the two examined mining projects are less clear than the negative impacts and are conditional. These potential benefits include employment opportunities, training and some funding to the First Nation if a negotiated benefit agreement occurs.

Any infrastructure concept will need to be adapted to quickly changing future conditions, considering climate change. The *Canada's 2030 Emissions Reduction Plan* both commit Canada to increasing decentralized, renewable energy production and cutting emissions by 40 to 45 per cent within the next decade and net-zero by 2050 (Government of Canada n.d.). Parallel to building decentralized power generation, which reduces the need for long-distance transmission lines, phasing out fossil-fuel production will eliminate the need for oil and gas pipelines. Canada's commitment to net-zero emissions by 2050, will require transportation and utility infrastructure to support this future reality.

6.0 DISCUSSION

The notional route suggests that the focus of the northern corridor is on resource extraction, rather than Indigenous community development. The notional route's proximity to many greenstone belts, oil patches, potash mines and other resources would prioritize the transport of resources to global markets over community needs. Providing Indigenous people with permanent jobs, access roads, better food security or partnership appears to be an afterthought or possibly off the radar completely. Without a commitment to connecting no-road-access communities, the idea that Indigenous communities with roads to service centres may have higher food security and reduced food costs is largely irrelevant to the northern corridor discussion. Even if access roads for remote communities were a core component of the northern corridor, it is not a magic solution to food security. A holistic perspective for solving the food insecurity problem needs an overarching, culturally appropriate and Indigenous-led strategy for food security and wellbeing.

Corridors and pipelines have worsened food insecurity, based on available evidence in Canada (Chan et al. 2021, York Factory First Nation n.d.). The highest food insecurity at the provincial level is recorded in Alberta (Chan et al. 2021), where pipelines and resource extraction corridors are prevalent. Also, the negative impact of resource corridors and extraction on food security is evident from the case studies of Norman Wells, Shoal Lake 40 (pipeline infrastructure) and York Landing (hydro development).

Like the fur trade in Canada, a northern corridor promotes the unsustainable use of resources to fuel the global economy, supercharged by late-stage capitalism and colonialism's legacy of racism. The notional northern corridor will have many negative environmental, social, economic and cultural impacts on Indigenous communities. The benefits of a northern corridor, on the other hand, are less straightforward for Indigenous communities and, without major changes to the colonial policy, may never materialize. The historical ideology embedded in the Indian Act presents large barriers for Indigenous communities to directly benefit from Native land and resources or for them to regulate these developments.

By declaring Indigenous people wards of the state, the Crown gained control of Native land and resources. The revenues from land and resources serve largely to benefit the Crown and multinational corporations while keeping First Nations people in economic poverty; e.g., Imperial Oil's dealings with the Crown trustee rather than the Sahtu and Métis peoples, whose Native land was exploited. At Norman Wells, Shoal Lake 40, and York Landing, the Crown enforced its colonial policy over Indigenous people along the lines of Canada's statement: "Our Indian legislation generally rests on the principle that the aborigines are to be kept in a condition of tutelage and treated as wards or children of the State" (Department of the Interior 1876, 14).

The colonial and racist policy emanated from the Papal Bull of 1455, designed to keep Indigenous people in "perpetual servitude" (Bull Romanus Pontifex 1455). Under this colonial framework, a northern corridor is a recipe for perpetual servitude for impacted Indigenous communities. By holding all Native lands in trust, including reserves, the Crown trustee usurps control from First Nation people to push through development and a northern corridor on Native land. The Indian Act that applies different laws to Indigenous people than to non-Indigenous people violates the Universal Declaration of Human Rights

and Canada's constitution (Blacksmith et al. 2021). The Canadian government continues to keep Native people in a "condition of tutelage" (Department of the Interior 1876) by controlling their land and finances under the Indian Act, according to its stated purpose.

Canada's Indian Act financed the genocide perpetrated by the Indian residential schools (Truth and Reconciliation Commission (TRC) 2015). TRC 2015 found every manner of genocide in Indian Residential Schools (IRS) according to the United Nations definition: "genocide means any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such: (a) Killing members of the group; (b) Causing serious bodily or mental harm to members of the group; (c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part; (d) Imposing measures intended to prevent births within the group; (e) Forcibly transferring children of the group to another group" (UN 1948, article 2). Withholding food was commonplace at these schools, which resulted in intergenerational food insecurity and trauma. Through its policies, Canada continues to inflict food insecurity and poverty on First Nations in violation of UN 1948, article 2c.

Food insecurity in Indigenous communities results from racism, colonial policies, displacement and ongoing systematic marginalization (Blacksmith et al. 2021; Leblanc-Laurendeau 2020; Natcher et al. 2016; Thompson, Bonnycastle, and Hill 2020), and not simply from high transportation and storage costs. Higher rates of severe food insecurity amongst survivors of residential schools and their descendants demonstrate the role of colonial policies in creating intergenerational food insecurity. Fighting the root causes of food insecurity and the resource curse requires ensuring Indigenous people's equality, human rights and land/resource rights. The Indian Act and the high food insecurity rates of Indigenous people in Canada are grave injustices. The high rates of food security in Indigenous communities across Canada, not only remote ones, constitute a health emergency requiring immediate action in the form of a holistic, Indigenous-led strategy. Currently, no such plan is in place to deal directly with the food insecurity crisis in Indigenous communities, and the proposed Northern Corridor does not provide the answer, focused as it is on trade rather than human rights, Indigenous development and health.

7.0 CONCLUSION

Food insecurity rates for Canada's Indigenous people are the worst among developed nations, demanding immediate action. Food insecurity in Canada is widespread across the majority (51 per cent) of First Nations households, with even higher rates for the Inuit in Nunavut (63 per cent), Indigenous communities without access roads (65 per cent) and Alberta First Nations (60 per cent) (First Nations Information Governance Centre 2018; Tarasuk, Mitchell and Dachner 2016, Chan et al. 2021) and are expected to worsen with climate change and the war in Ukraine. Indigenous peoples' food insecurity is associated with a shorter life expectancy and higher mental and physical illness rates, including four times the diabetes incidence, compared to Canada's non-Indigenous populations.

The food security and case study research shows that resource corridors worsen food insecurity, creating a 'food security curse.' Indigenous communities near pipelines and other resource corridors in Canada experience higher food insecurity rates. Alberta is

covered in pipelines to market its extracted oil and gas resources, and yet has the highest rate of food insecurity for First Nations of any province (Chan et al. 2021). Resource and food security curses, for Indigenous people, are apparent across Canada, including at Norman Wells in the Northwest Territories, Shoal Lake 40 in Ontario and York Landing in Manitoba. In each of these cases, the industrial activities of resource extraction negatively impacted the environment and the health and socio-cultural aspects of Indigenous communities without providing road access, infrastructure or long-term jobs, and without lowering food prices. The Crown's Indian Act trusteeship controls First Nation land and resources without fully applying revenues for needed services, programs and infrastructure that directly benefit Indigenous people. As a result, even large First Nations communities typically lack food infrastructure, hospitals, paved roads and post-secondary education facilities (Hill, Bonnycastle, and Thompson 2020; Adegun and Thompson 2021). This lack of equity in services, programs and infrastructure amounts to mismanagement of the Indian Act trust and the equality clause of the Canadian constitution (Blacksmith et al. 2021) and leads to food insecurity.

Mapping the intersections of the notional northern corridor with Indigenous communities, greenstone belts and Indigenous-led protected areas indicates First Nations priorities were not considered in its conception. The corridor transects many greenstone belts, but runs nearby to only a few of the 122 Indigenous communities lacking road access. With the notional northern corridor solely dissecting First Nations land under the colonial Indian Act and avoiding Inuit land, this route is embedded in the notions of colonialism and racism. As the Indian Act gives a right of way to fast-track resource extraction and resource corridors for Crown benefit, First Nations territories and foodsheds will be negatively impacted by resource extraction and activities resulting from the Northern Corridor due to this resource curse. The notional corridor route to Churchill in northern Manitoba crosses a proposed Indigenous-led protected area, which differs starkly from the Indigenous-led proposals like NeeStaNaN. Ideally, Indigenous communities are included as partners from the start to build dialogue and support. For example, the School of Public Policy partnered with Denenedeh Investments Incorporated, which represents 27 Dene First Nations in the Yukon. Across Northern Canada, Indigenous people comprise the vast majority of the population, which calls for infrastructure development to be Indigenous-led and their food security to be a priority.

An Indigenous-led strategy to end food insecurity in Canada's Indigenous communities within the next decade is needed to prevent a health and human rights crisis. Removing barriers to restoring Indigenous control over their Native land with adequate funding will attain food security for all. Programs and policies to tackle food insecurity in Northern Canada must be holistic and Indigenous-led, with adequate funding for services and infrastructure.

To prevent further emergencies stemming from this food crisis, an Indigenous-led strategy to bring Indigenous food insecurity to the goal of functional zero has to take priority over a resource corridor. The ongoing food insecurity is a health and human rights emergency that needs to be tackled directly — not through the false promise that a resource economic boom will alleviate food insecurity in Indigenous communities. The suggestions below indicate that food security is attainable within a decade if priorities shift.

1. Restore jurisdiction over essential services to Indigenous communities from the colonial government to ensure that needs and human rights are met for food infrastructure, road access, hospitals, banking and telecommunications.
2. Remove Indigenous-specific systemic racism to Indigenous people's food security, health and self-governance.
3. Address income as a key determinant of food security by applying poverty reduction strategies in Indigenous communities, including basic income, paid training/education programs and community-led development jobs.
4. Invest in Indigenous food systems in each Indigenous community, including the infrastructure, services and programs. Promising programs to scale up and out include: on-the-land traditional land-use education programs (hunting, fishing, farming, stewardship, etc.), Arctic Co-op and community food centres on reserve.
5. Fund Indigenous community-led post-secondary education to enhance food harvesting and employability, including on-the-land programs, protected areas and land guardians, regenerative agriculture, permaculture training, community development, watershed planning and cooking apprenticeships.
6. Shift subsidies, such as the Nutrition North Canada subsidy, from colonial stores to Indigenous food co-operatives and Indigenous people in all reserves, removing the 'middleman' and replacing the cost of the northern food basket as a success indicator.
7. Reject the colonial approach to building utility corridors based on non-sustainable extraction of resources, and prioritize human needs and rights of Indigenous communities for development. Establish future-proof infrastructure to withstand climate change, accommodate distributed renewable energy and foster a zero-carbon, sustainable future. An Indigenous-governed and owned Northern Corridor that serves Indigenous communities' interests holds possibilities, but needs a legal analysis, considering colonial control over resources and land, the Indian Act, systemic racism decolonizing to Indigenous jurisdiction, revenue and ownership, as Indigenous people are the vast majority in Canada's north. Ensuring that First Nations' food security benefits from a northern corridor may require changes in legal standing, such as overturning the Indian Act.

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