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Harnessing the Potential of Social Enterprise in Garden Hill First Nation

By Marina Puzyreva

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Unit 205 – 765 Main St., Winnipeg, MB R2W 3N5
TEL 204-927-3200 FAX 204-927-3201
EMAIL ccpamb@policyalternatives.ca

About the Author:

Marina Puzyreva is an economist and Research Associate of the Canadian Centre for Policy Alternatives-Manitoba. In her past projects she was involved in research with First Nations communities and organizations on the issues of poverty, missing and murdered Indigenous women and funding for child welfare services. She holds an MA from the University of Manitoba and a BA from the Higher School of Economics (HSE, Moscow).

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List of Abbreviations

ADI	Aboriginal Diabetes Initiative
CD	Community Development
CED	Community Economic Development
FFMC	Freshwater Fish Marketing Corporation
GHFN	Garden Hill First Nation
INAC	Indigenous and Northern Affairs Canada
NHFI	Northern Healthy Food Initiative
NHS	National Household Survey
NIHB	Non-Insured Health Benefits
NMFCCC	The Northern Manitoba Food, Culture and Community Collaborative
NNC	Nutrition North Canada
RNFB	Revised Northern Food Basket
SE	Social Enterprise
T2D	Type 2 Diabetes

Introduction

This paper explores the economy, the health status, and particularly the issue of food sovereignty of Garden Hill First Nation (GHFN), a remote community located 610 kilometers northeast of Winnipeg, Manitoba. Similar to many northern communities, in GHFN the history of colonialism, assimilation and the legacy of residential schools have shaped the egregious conditions of poverty that many on-reserve residents struggle with every day. GHFN's formal economy is under-developed and among many other poverty-related issues the residents are confronted with high rates of unemployment, a housing crisis and high food prices. Moreover, the loss of culture and often ties with family have made it extremely difficult for the new generation to preserve traditional livelihoods that focus on hunting, fishing and gathering, this way undermining the community's autonomy in providing food to its residents.

Due to the remoteness of the region, food items and other necessities are shipped in from the south at high cost. That cost is passed on to residents in the local Northern Store which has almost sole control over the provision of food. Prices are high and access is inconvenient as the store is located on an island off reserve. The only food available for sale on the reserve is junk food (e.g. fries, soda drinks). Since the incomes in the community are low, the healthy food options (e.g. fruits, vegetables, meat, milk) become unaffordable for many residents who instead tend to buy cheaper processed and packaged foods, replacing traditional diets with one high in fat, sugar and sodium. As a result, a great number of community members suffer from diabetes, high blood pressure and cardiovascular disease. For a long time diabetes was considered to be an adult disease, however nowadays it is even diagnosed in children, something that was unheard of before the 1980s in Indigenous communities. Treating diabetes and its complications and providing social assistance to the unemployed involves significant amounts of government spending which only end up maintaining the status quo.

In this situation innovative interventions that will guide GHFN towards self-sufficiency and that will positively transform the economy and health of the community are called for. The new Social Enterprise (SE) called Meechim Inc. in GHFN embraces the concept of Community Economic Development (CED) and seeks to localize the food production to meet the community's needs by way of starting a local farm and engaging community resources. This strategy is believed to plug

the holes in the 'leaky bucket', making sure that money spent on meeting people's needs stays in the community. Moreover, it is believed to help create jobs in farming, production, delivery, and administration and help manage and reduce diabetes rates in the community by increasing access to healthy, fresh, local food (Loney, n.d.).

The idea of developing non-market solutions for poverty stricken communities in Canada's North is not new. Some recommendations were developed but never acted upon,[1] for some programs the funding was discontinued. In Thompson et al. (2014), the authors note that "Many people in First Nation communities feel they have been "studied to death." Researchers have come, gathered data, and never been heard from again." (p. 188). Community members are understandably leery of outside researchers. In these circumstances, self-determination and community input are needed to ensure that there is sufficient support to implement the projects or programs after the initial enthusiasm subsides (Loxley, Silver, & Sexsmith, 2007).

In this paper the economic and health profile of the community, including the amount of government spending on diabetes and welfare will be presented. By putting Meechim Inc. in the context of the community's economic and health problems and needs, the SE's goals (reduce diabetes, create more jobs) will be assessed. Moreover, the enterprise's funding structure, governance, community engagement, administrative, financial and other barriers will be discussed. The potential of Meechim Inc. to pave the road towards food sovereignty and self-reliance will be examined.

Current government expenses on health and social assistance will be used to argue that strengthening the community's sovereignty will result in long-term savings for the government, provided the funds are directed towards prevention programs in a holistic way that acts on the social determinants of health. Although the study is community specific it echoes many problems common with other northern communities. In the end, it is the hope of this paper to suggest some pertinent measures that need to be taken by government and the initiative promoters in order to help maintain the positive momentum of the current efforts to localize food production.

This paper is produced out of a review of publicly available statistics on GHFN, literature on CED, diabetes, food, and interviews with 14 key informants that included community members, health practitioners, diabetes and food insecurity researchers, and specialists involved in healthy food initiatives. Moreover, valuable insights have been incorporated from the group conversations with the project funders from The Northern Manitoba Food, Culture and Community Collaborative (NMFCCC). A survey of 35 individual households was conducted in December 2015 and is also included in the study. The survey distribution and collection was facilitated with the help of Dr. Shirley Thompson and student researcher Malay Das from the Natural Resources Institute at the University of Manitoba. The research follows the principles of ownership, control, access and possession (OCAP) of the generated information or data (for more information see First Nations Information Governance Centre, 2014).

Historical Background of the Community: Traditional Food Culture

The discussion of any economic or educational interventions to improve health and food sovereignty has to be first placed in the context of Indigenous reality and it is not possible without giving a historical overview of the community and highlighting their perceptions and traditions around such an important component of their everyday subsistence as food.

Before the arrival of white settlers, native people worked as gatherers and hunters. The geographical area of the Island Lake region where the community of GHFN is currently located was not very fertile. Traditional diet was comprised of foods that were "high in animal protein, nutrient rich, and low in fat or high in marine sources of fat" (Earle, 2011, p. 2). The food consumed by Indigenous people included fish, bear, rabbit, moose, and berries (Socha et al., 2012). In addition, before 19th century there was a great reliance on bison for the economy of the prairie Indian tribes. Bison was used not only a food source but also as a major component that the native craftsmen utilized to supply clothing, shelter, tools, and weapons (Cumming & Mickenberg, 1972, p. 119).

Gardening and farming had a long tradition in Indigenous communities well before merchant capitalism and colonialism (Carter, 1990, pp. 36ff.), but was expanded in native communities after the white settlers began to penetrate the lands. In many cases it was missionaries who spearheaded the first white contact with Indians in the interior of the continent (Ponting, 1986, p.27) and who brought along with them their own knowledge of farming and gardening. At that time creating agriculturally-based communities was the major thrust of assimilation efforts (Ponting, 1986, p.28). The treaties signed by native people surrendered their lands to facilitate white settlement and also made provisions for supplies intended to help Indigenous communities utilize their remaining lands or make a living from hunting and fishing. As noted in Cumming and Mickenberg (1972): "Typically farm implements and supplies would be provided only as an initial outlay, but quantities of ammunition and other hunting and fishing materials would be furnished on an annual basis by the Government" (p. 125).

GHFN is a signatory to the 1909 adhesion to Treaty 5 ("Garden Hill First Nation", 2011) and until 1969, Garden Hill, Wasagamack, St. Theresa Point, and Red Sucker Lake all comprised the single Island Lake First Nation. The name of the community — Garden Hill — recalls the gar-

dening tradition that was practiced in the community for a number of years. The majority of the gardens were root crops — potatoes, carrots, onions, turnips. Some of them were the "exotics" such as squashes and corn. Although gardening may not have been their original historical practice, there is evidence collected by community members that gardens used to flourish in the area before the welfare system and the Northern Store took over. The Northern Store established the monopoly over the transportation and selling of food in the northern communities which almost substituted traditional livelihoods of hunting, gathering and gardening.

The loss of lands that followed the colonization process, confinement to the state allocated reserve land, institutional rules enacted through the Indian Act regarding the use of land and animal resources, sending children to residential schools detaching them from their families — all led to the erosion of the traditional Indigenous way of life. The traditional lifestyle was restrained at the same time the market foods could not meet the need for a healthy diet. High transportation costs and logistical barriers[2] resulted in extremely high food prices which contributed to the situation of general poverty (Socha et al., 2012). As a consequence, many Indigenous communities underwent a significant detrimental transition in their eating habits (Thompson et al., 2012).

Thus, food insecurity[3] has become a very common problem in the North and now we are clearly seeing the negative repercussions that came along with it — malnutrition, poor learning outcomes, developmental delays, depression, anxiety, suicide, worsening problem of diabetes and cardiovascular diseases. By observing 41 households in GHFN, Thompson, et al. (2012) found that 51% of the households are severely food insecure, and 37% of the households are moderately food insecure.

However, some traditional knowledge and practices are retained to this day. Some rituals remain — although perhaps not many are aware of their meanings and origins, like the fall and spring feasts. Food is often referred to as a celebration. Sharing is widely encouraged (Thompson et al., 2014). The land is of a paramount importance to the Indigenous way of life and the connection between land and food on the table needs to be reestablished.

Additionally, certain types of food are considered medicine. For example, whitefish is considered a helpful medicine against diabetes. Pickerel fat and swamp tea[4] are some medicines that are consumed to this day by a number of older community members in GHFN who try to maintain the traditional lifestyle.

Furthermore, harvesting and hunting shaped the language that the people of that region spoke. Although faded overtime, its revival is especially important for the retention of one's identity and recreating ties with the ancestral land. For example, according to an Island Lake community member "bush tea" in the area's dialect Oji-Cree translates as "*gaagigebag*" which describes the plant in the following way: "*gaagige*" is "forever" and "*-bag*" is a plant name suffix that means "a leaf" (Gourneau, n.d.). Thus, the tea is prepared with the "forever leaf" that can be harvested all year round.

The Indigenous way of life, although enormously constrained, has persisted and often remains strong among community members. This brief introduction has shown that language, rituals, traditional medicine, perceptions about food (strong concept of sharing, traditional food as medicine) — are all components of the traditional lifestyle, and, therefore, any intervention should be building upon them in a holistic manner. Furthermore, the fundamental historical connection to the land needs to be respected and thus sustainable development is the type of development to be followed.

> "Elders always say — go back to the way we used to live — to me, that doesn't mean to go back to teepees and wigwams. It is to go back to that

way of life where you respecting everything that you are taking."

Byron Beardy,
Community member and Food Security Coordinator,
Four Arrows Regional Health Authority.

The next section will proceed with the current demographic and economic analysis of GHFN providing information on the community's income and expenses and highlighting the community's divergent economy.

Demography and Economy of Garden Hill First Nation

This section will provide a snapshot of the GHFN economy. Indicators such as population growth and structure, unemployment rates, incomes and government transfers will be discussed. More specifically, the section will try to answer the following questions: How much social assistance do GHFN residents receive in total and how much can individual families expect to collect? How much did the First Nation receive in salaries from the federal government in 2015? How much do the households spend on food?

Using publicly available statistics on GHFN demography and economics, the welfare rates as well as the survey of 35 households conducted as a part of this research, approximations will be given regarding the amounts of social assistance received by First Nation residents, spending on food and transportation.

With regards to population statistics, we can observe some inconsistencies from a number of sources. For example, according to Councillor Morris Knott there were 4,400 people living in GHFN in 2015 which was mentioned in an article on the Manitoba government's website ("Manitoba government investing in healthy food initiative for northern communities", 2015); in an October 2015 article at CBC News (CBC News, 2015), Shaun Loney estimated there were 5,000 residents. When the author visited the Reserve in September 2015, community members reported that the population of GHFN is reaching 5,000 people which makes GHFN a fairly large northern community.

Turning to the official sources, we are able to find that the National Household Survey (NHS) counted 2,776 people living in GHFN in 2011 which had an increase of 13% in 5 years since 2006, if we compare it to the estimate from the 2006 Census Population and Dwelling Count Amendments (See Table 1).[5] Additionally, in the Table 1 we can see that the Census data from Statistics Canada differs from the total registered population on reserve as reported by Indigenous and Northern Affairs Canada (INAC). The total registered population of GHFN on July 2016 equaled 4,642 persons with registered male and females on reserve being 3900 persons.

Even though the total population reported in the NHS is less than the total registered population, all important statistical information on labour force, incomes and household composition originate from this survey. That is why we take the NHS 2011 survey data as a starting point for analysis.

TABLE 1 Population Statistics for GHFN

Source	2016	2011	2006
INAC	Total registered population 4,642 (July 2016); On-reserve 3900	Total registered population 4,253; On-reserve 3,663	n/a
NHS; Census of Population	n/a	2,776	1,898 (2,451 according to revised count[6])

TABLE 2 Workforce Characteristics, 2011: Percentages

Labour Force Indicators	GHFN	Manitoba
Participation rate	39.4	67.3
Employment rate	29.5	63.1
Unemployment rate	25.2	6.2

TABLE 3 Income Characteristics, 2011

Income characteristics	GHFN	Manitoba
Persons 15 years of age and over with income	1,345	901,035
Avg. total income (all persons with income ($))	12,957[8]	36,696
All persons with earnings (counts)	480	663,020
Avg. earnings (all persons with earnings ($))	20,077	37,579
Composition of total income (100%)	100	100
Earnings — % of income	56	75
Government transfer — % of income	42	13
Other money — % of income	2	12

SOURCE: NHS 2011, the socio-economic indicators prepared for INAC (Income characteristics, 2015).

The population of GHFN has not only increased in recent years but it also underwent some structural changes: the number of young people is growing rapidly with persons aged 0–19 increasing from 945 persons in 2006 to 1440 in 2011, a growth of more that 50% ("NHS Profile, GHFN, IRI, Manitoba, 2011"; 2006 Census).

Another distinct characteristic of the GHFN community is the low participation rate in the labour force (39.4%) especially as compared to the provincial rate (67.3%). In 2011 the population 15 years of age and over totalled 1,560. Given the employment rate of 29.5%, we can find that around 1,100 people or 70.5% of population above 15 years old were either not in labour force or unemployed but looking for work, which in crude terms may suggest that this proportion of people were qualified to receive social assistance. The high number of reserve residents living on welfare is a well-documented fact. On Manitoba reserves it is estimated that about half of the residents live on welfare (Rabson, 2015).

As for the income acquired by GHFN residents, NHS estimated that there were 1,345 persons 15 years of age and over with income and the average total income equaled $12,957, which is almost 3 times less than the average total income for the province as a whole. Knowing this,

TABLE 4 **Salaries and Benefits by Segment**

Segment	2015	2014
Health	$2 437 295	$2 329 049
Education	$7 640 315	$6 352 710
Social	$451 867	$415 386
Economic development	$70 306	$65 726
Public Works	$578 273	$2 424 464
Housing	$223 275	$0
Band government	$431 478	$977 341
Private enterprise	$332 611	$359 923
Total in salaries and benefits	$12 165 420	$12 924 599

SOURCE: Garden Hill First Nation Notes to Financial Statements Year ended March 31, 2015

we can find that the total income in the community equaled $17,427,165 in 2011.

There were 480 persons with earnings which exceeded the number of the employed persons by 20 people. Average earnings equaled $20,077 and consequently the total earnings in the community were $9,636,960.[7]

Government transfer as percentage of income was 42%, therefore government transfers in 2011 summed to approximately $7,319,409.

Most of the working population of GHFN are employed in the public sector like band government, health facilities and the school. The amount of salaries and benefits as part of federal funding for the First Nation is shown in Table 4. In total the First Nation received $12 million in salaries and benefits in the year ended March 31, 2015.

Calculating Welfare Amounts

Like all Canadian citizens, registered Indians may receive social assistance and social services provided they meet the eligibility requirements. First Nations Status Indians on reserve may receive Federal Income Assistance which is based on provincial EIA rates. Moreover, First Nations are eligible for assistance under a number of other federal programs such as the Canada Child Benefit.

The social assistance programs have many components and the rates are dependent on many factors such as family's composition, financial situation and health status. In view of the complexities associated with calculating precise amounts according to the situation of individual families while having only aggregate data on families available from NHS 2011, we have made a number of assumptions to help us arrive at feasible approximations of the welfare amounts received in GHFN. These assumptions are as follows:

Income Assistance:

- The Northern rates for the households residing in remote areas that do not have all-weather road, rail or water travel access directly to the community are taken from the EIA Administrative Manual and applied in our calculations of the basic social assistance in GHFN.
- The assistance rates are averaged, so that they represent the average rates for families with one, two or three children irrespective of children's ages.
- The Northern Energy Cost Benefit (NECB)[9] is not included in the calculations.
- In cases where NHS reports "3 or more children", we are considering the family

TABLE 5 Annual welfare transfers in GHFN

Income Assistance	Other Benefits	Total
$6,812,756	$6,774,300	**$13,587,056**

to have only 3 children. Therefore, welfare payments for additional children above 3 have not been taken into account, so that total transfer amounts are likely underestimated.

- The rate of 70.5% — percentage of unemployed persons and persons not in the labour force (NHS 2011) — is applied to arrive at the number of families receiving income assistance.
- The rates for participants with disabilities are applied to 63% of households, which is the share of the households with diabetes in the total number of households observed in the survey of the 35 individual households which will be discussed below.

INAC is responsible for providing on-reserve residents with social and income assistance services that follow provincial rates and eligibility criteria. The Northern rates for the households residing in remote areas that do not have an all-weather road, rail or access by water are taken from the EIA Administrative Manual and applied in our calculations of the basic social assistance in GHFN.[10]

Other Programs:

- Anther type of assistance is the Canada Child Benefit (CCB), a program that replaced the Canada Child Tax Benefit (CCTB), the National Child Benefit Supplement (NCBS), and the Universal Child Care benefit (UCCB) in July 2016.[11]
- In order to calculate the CCB where rates differ according to the age of a child, we have estimated the share of children under 6 in census families to be equal to 39% and the share of children 6–17 to be 61% (NHS, 2011).
- Given the lack of employment opportunities in the First Nations communities, and, therefore, low incomes, CCB is applied at the maximum level to all census families with children.
- Working Income Supplement (WIS) and The Child Disability benefit (CDB)[12] are not included in the calculations (Canada Revenue Agency).

After performing the calculations, we have arrived at the estimate of approximately $13.6 million in annual welfare transfers to GHFN (See the Table 5).

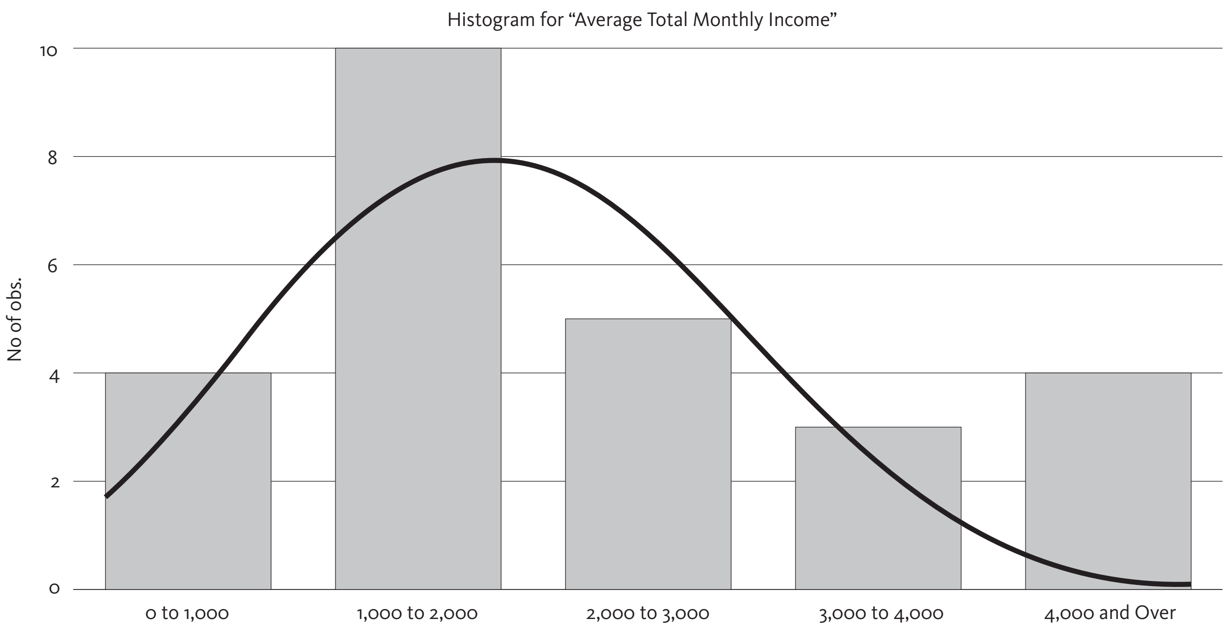
In total both income assistance and salaries[13] sum up to $25.7 million. According to this calculation, and assuming the same population growth as in the period between 2011–2016 (13%), the average total income per person above 15 years of age with income equals approximately $16,944 per year, which is 30% higher than the amount reported in Table 3 for 2011.

Apart from the consolidated total it is informative to take look at how much a particular household may receive in basic income assistance under the specific family circumstances. For example, a couple with 3 children (5, 10 and 12 years old) can expect to receive $30,674 per year ($2,556 per month); a single mother with 2 children (5 and 10 years old) — $20,292 per year ($1,691 per month), a single individual $4,151 per year ($346 per month) and a single individual with disability $5,489[14] (457.39 per month).

Small-Scale Household Survey

Living on income assistance in a northern community and having enough money to ensure a decent standard of living is easier said than done. One of the greatest struggles that a resi-

FIGURE 1 **Total Household Monthly Income Distribution in the Sample**



dent of GHFN must face is feeding oneself and one's family.

In order to help examine spending on food by individual households, a survey was conducted in December 2015 as part of this research project. The respondents were presented with a questionnaire that inquired about household income, source of income, monthly spending on food, transportation and health status. We greatly appreciate the assistance of Dr. Shirley Thompson and student researcher Malay Das from the Natural Resources Institute at the University of Manitoba in helping to facilitate the distribution and collection of the questionnaire. For a sample of the questionnaire please refer to Appendix B.

Thirty-five completed questionnaires were returned to the researcher. Nine questionnaires were removed from the analysis due to apparent inconsistencies in the responses, which reduced the sample size to 26 households. The responses for the question on household income were presented in intervals and were later averaged for analysis. Even with the evident shortcoming of the small sample size compared to the population size (there were 545 households in GHFN in 2011), our survey brings out a number of key indicator values that are similar to the general demographic analysis conducted by Statistics Canada in 2011. The following is a summary of the key characteristics of the sample:

- Total number of people in the surveyed households is 159. Children aged 0–17 years old constitute 47% of this number, almost identical to the 48% of the comprehensive household survey in 2011 according to NHS.
- The average annual income per person above 18 years in a household with family members employed for wages is $20,182 (see Table 7) whereas average earnings for persons above 15 years old with earnings were $20,077 in 2011 ($21,636 in 2016 dollars) according to NHS.
- The average annual income of people on social assistance in the sample is $7,436 (see Table 7) whereas the average amount of government transfers per person on social assistance equaled $8,461 in 2011.

TABLE 6 Descriptive Statistic for the Variable "Total Annual Household Income"

Statistics	Total sample	Sub-sample 1. source of income: wages, child benefits	Sub-sample 2. source of income: welfare, child benefits, pension
Count	26	14	12
Mean	27,225	35,137	17,995
Mean LCL*	20,972	26,916	10,681
Mean UCL**	33,478	43,358	25,309
Variance	239 684 237	202 747 253	132 519 278
Standard Deviation	15 482	14 239	11 512
Mean Standard Error	3 036	3 806	3 323
Coefficient of Variation	0.57	0.41	0.64
Minimum	6,000	14,994	6,000
Maximum	56,994	56,994	44,994

* Lower confidence limit
** Upper confidence limit

TABLE 7 Descriptive Statistics for "Annual Income Per Person 18 Years Old and Above in a Household"

	Employed (source of income: wages, child benefits)	Unemployed/Not in labour force (source of income: welfare, child benefits, pension)
Mean	20,182	7,435
Standard Error	3 868	1 208
Median	18,746	6,998
Mode	25,497	6,998
Standard deviation	14 473	4 183
Minimum	2,999[15]	3,000
Maximum	56,994	16,497
Count	14	12
Confidence level (95%)	8 357	2 658

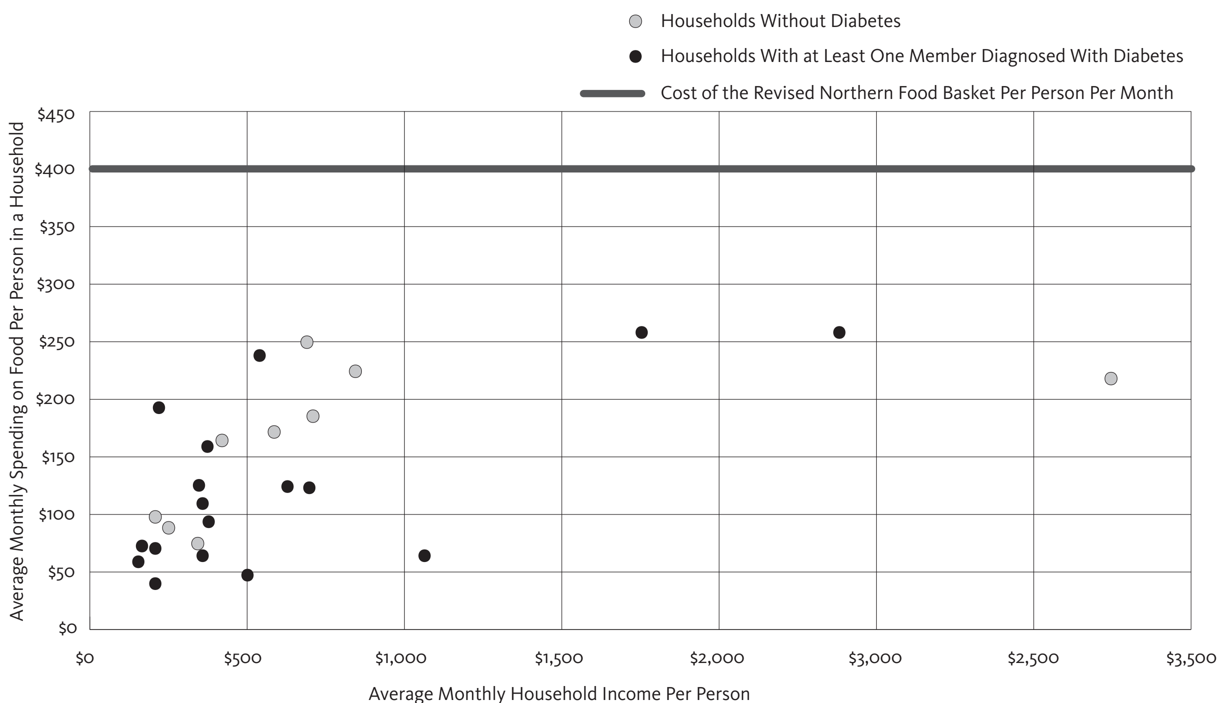
- The rate of diabetes prevalence in the sample is 21.34% (12% for the whole population — see the section on diabetes)

Figure 1 depicts the distribution of the total household monthly income with the greatest share of households (38%) in the survey earning between $1,000 and $2,000 per month.

Table 6 presents the descriptive statistics for the variable "total annual household income" for the entire sample, as well as for two sub-samples, according to the employment status of the respondent — one with a group of households on social assistance, another with at least one person in a household earning a wage. Based on the sample of 26 households, we have estimated the average (mean) total annual income per *household* to be $27,225 with a margin of error of plus or minus $3,036 at 95% confidence level.

For the purposes of comparison with the NHS 2011, we have also looked at the annual income per person 18 years old and above in a household which is presented in Table 7. The average annual income per person 18 years old and above in a household with source of income of primarily wages and child benefits equals

FIGURE 2 **Average Monthly Spending on Food Per Person in a Household. Breakdown by the Health Status of the Household**



$20,182; for the households fully on social assistance, it is $7,435.

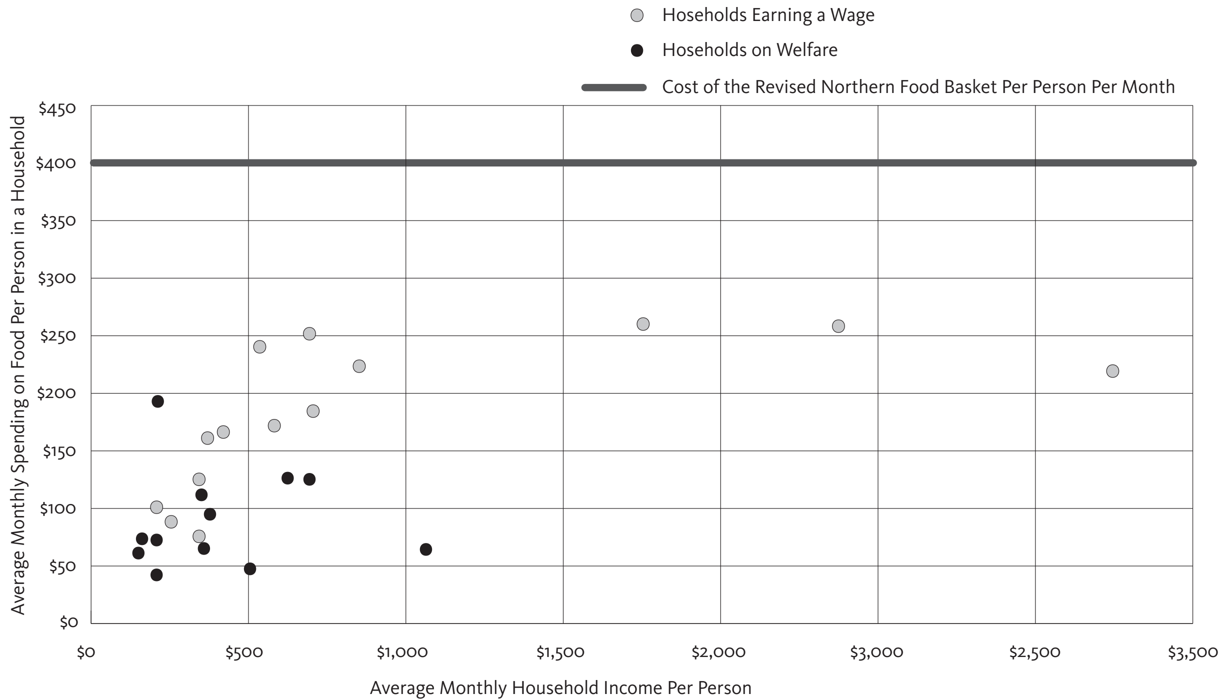
Due to the strained financial conditions of people in GHFN who predominantly live on welfare, it is extremely hard to balance expenses for basic needs.

Nutrition North Canada (NNC) estimated that the cost of a nutritious diet for a family of four for one week in GHFN in March 2015 equaled $401.41 ("Cost of the Revised Northern Food Basket in 2014–2015"). This so-called Revised Northern Food Basket (RNFB) includes 67 standard food items and it is used by NNC to monitor the cost of healthy eating in isolated northern communities. Taking into consideration the fact that a couple with 2 children may receive on average $2,000 per month in social assistance, the cost of such healthy diet would exhaust 80% of a family's monthly allotment. In an earlier study (Thompson et al., 2014) found that fisher families on welfare in GHFN were very food insecure; they further note that "the amount of social assistance is not indexed to account for the much higher food and gas prices in the North" (p. 186).

In general, and this applies to GHFN, the major cost driver for the extremely high food prices in the North is transportation. The absence of an all-weather road to the community puts heavy reliance on Perimeter Air for transportation and increases freight costs[16] and inhibits resupply. Another major contributing factor to high costs is the amount of spoilage (Enrg Research Group, 2014).

The main store where residents of GHFN shop for groceries is the Northern Store located on the Stevenson Island outside of the reserve. The following is a list of a few selected items and their prices in the Northern Store as of September 2015 with the prices for the same items in Winnipeg indicated in brackets: $10.79 for one kilogram of green grapes ($5.45), $2.15 for one large orange ($1), $4.15 for hamburger buns ($0.94), $4.15 for 100% whole wheat Wonder bread ($2.28), $6.09 for raisin cinnamon whole wheat bread ($3), $7.95 for a 4-litre carton of milk ($5).

FIGURE 3 **Average Monthly Spending on Food Per Person in a Household. Breakdown by the Employment Status of the Household**



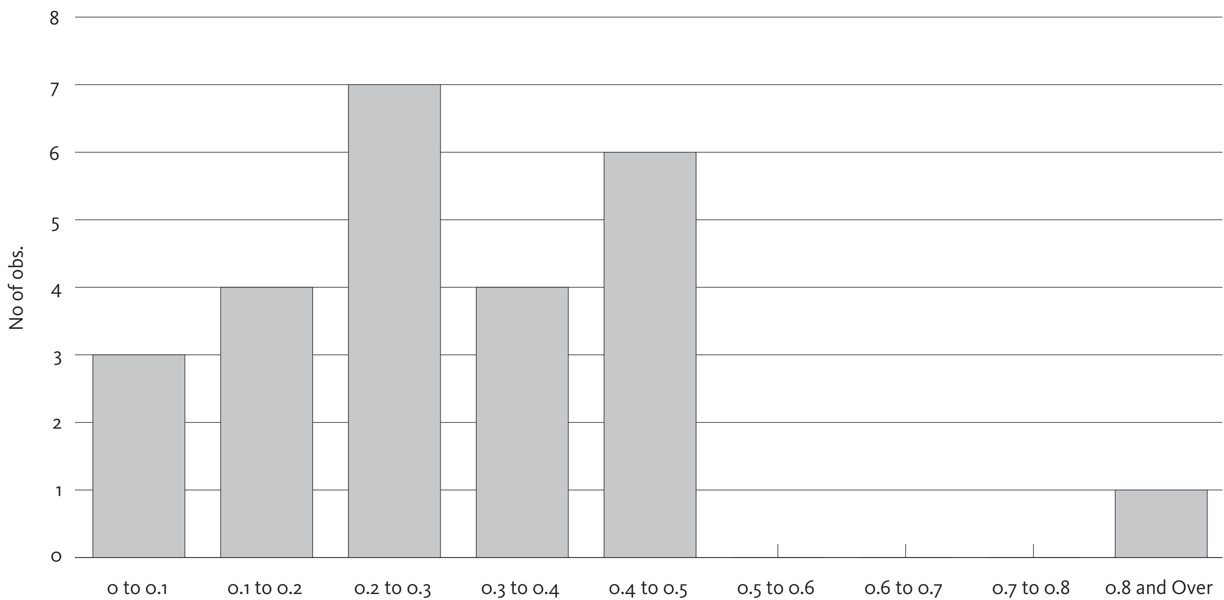
Since the Northern Store is located on the island outside of the reserve, the cost of transportation is inevitably linked to the cost of grocery shopping in GHFN. From the survey it was found that 50% of the respondents spent approximately $10 for transportation to the Northern Store, 23% spend $20 and the remaining respondents spent up to $50 per trip to the grocery store.

The graphs below depict the spending patterns on food items among the households in the survey. The relationship between average monthly household income per person and the average monthly spending on food per person in a household can be observed. The average spending on food per person per month can be compared to the cost of the RNFB. Additionally, the breakdown of the observations by health status and employment status of the household is made respectively in two graphs.

From the graphs it can be seen that initially, as the average household monthly income per person grows, so does the average monthly spending on food per person. Afterward, however, the increase seems to gradually diminish and above an income level of $680 per person, spending on food per person stabilizes at a level of $250 per month approximately. It is important to mention that even the highest observable spending on food in the survey ($259 per month for one person) constitutes about 65% of the required level of spending needed in order to maintain a healthy diet as calculated by the RNFB.[17] Moreover, no apparent connection is observed between spending more on food per month and not having diabetes in a household (Figure 2). However, the situation is different if we look at the households with members employed for wages. As expected, they tend to have higher incomes and hence allocate larger amounts of money for food expenses (Figure 3).

Overall, according to the survey, the average share of household's income spent on food equals 30%. If we apply this rate to the total amount of social assistance and salaries found earlier

FIGURE 4 **Share of the Household Income Spent on Food Consumption**



($24.5million), we can conclude that roughly $7.35million is spent on food in the community per year.

A more detailed distribution of the household income share spent of food in the sample can be found in Figure 4. The histogram shows how many people observed in the survey spent on food in each given interval — between 0 to 10% of their income, between 10% and 20%, and so on.

In conclusion, it can be observed from the above graphs that even those respondents who are employed and therefore have higher disposable incomes tend to fall behind relative to what should be spent on a healthy diet. Apart from low incomes there are possibly other reasons for poor diets. There might be lack of food choices at the store. There is also lack of awareness about healthy food options. A related issue is the poor condition of the community's housing. Households with no running water and no stove will be forced to buy food which doesn't need cooking. Overall, as the result of poverty and the high cost of food in GHFN, people have developed unhealthy eating habits by looking for cheaper foods to eat, mostly canned food that is high on sodium, and even substituting coke for water.

> "When they see cheap stuff on the shelf, they would buy it doesn't matter how many, they will buy 5 or 6 items of those. They will buy anything cheap but it doesn't matter how many they put in their cart. If there is something healthy there and prices are more expensive, they won't bother looking at that."
>
> *Lionel Flett,*
> ADI *worker, Nursing station*

> "But the awareness needs to be engrained in them. You can buy healthier foods, maybe in bulk. For example, barley versus wheat."
>
> *Byron Beardy,*
> *Community member and Food Security Coordinator,*
> *Four Arrows Regional Health Authority.*

In conclusion, most of the money going into the First Nation comes from the Federal government in the form of social assistance and salaries for the jobs in the sectors such as health and edu-

cation. The money is subsequently spent on the food and services of the companies, many of which are owned by people who reside outside of the community (see Appendix A for the list of businesses operating in GHFN). This characterizes the GHFN economy as a divergent economy. It exhibits a lack of self-sufficiency developed as the result of the foreign ownership and control of domestic resources and production for export out of the community (Loxley et al., 2007).

Overall, low welfare rates that are not indexed to higher cost of living on reserves, combined with poor infrastructure have an inevitable negative impact on the well-being of the people living in GHFN. The next section will discuss the health implication of this lifestyle and the associated health costs by connecting the findings of this section to the problem of diabetes that is insistently prevalent in many Indigenous communities.

Health Status of the Community

Nutrition is the focal point of many health problems. It was shown in the previous section that the GHFNs residents' spending on food is severely restricted by their low incomes relative to the cost of the healthy food basket. Poor nutrition and a lack of exercise (Lemstra et al., 2013) have inevitably contributed to the rising number of residents living with serious diseases that impair one's ability to work, enjoy life and to fully participate in society. As in many remote northern communities, the most common health problem in GHFN is diabetes. What follows is a discussion of the great impact of this health issue on GHFN. The nature of the disease and the possible effective interventions that can ameliorate one's condition will first be examined, followed by a review of the costs resulting from many people living with diabetes in GHFN.

Diabetes: Effective Medical and Lifestyle Interventions

Diabetes is associated with elevated blood glucose and can be classified into four types: Type 1, Type 2, prediabetes and gestational diabetes.

- In case of Type 1 diabetes the body (pancreas) is unable to produce insulin, an essential hormone that regulates sugar (glucose) in the bloodstream and helps the body to use it for energy. It is typically diagnosed in children and young adults.
- Type 2 Diabetes (T2D), on the other hand, usually develops later in life, and it occurs when the body cannot effectively respond to insulin in order to use or store the blood glucose it gets from food. T2D cases make up the majority of all diabetes incidences (e.g. 96% of all cases in Manitoba in 2005/06, "Diabetes in Manitoba A Call to Action", 2009). The common risk factors for T2D are age above 40, family history of diabetes, decreased rates of physical activity, stress, unhealthy diet, obesity/metabolic syndrome.
- Prediabetes or impaired glucose tolerance exists when blood glucose is elevated, but not as high as in T2D. Gradually, prediabetes is very likely to develop into T2D; that's why the detection of prediabetes is important.
- Gestational diabetes may develop during pregnancy ("Insulin Basics", 2013; Canadian Diabetes Association, 2011).

If denied proper treatment, high glucose levels can lead to serious damages to blood vessels, nerves and organs such as heart, kidneys and eyes. (Canadian Diabetes Association, 2011; "Facts & Figures: Diabetes", n.d.) Therefore, diabetes is often associated with life-threatening complications such as kidney failure, heart attack, blindness, and neuropathy (losing feeling in the hands and feet). People living with diabetes have lower life expectancy — the lifespan is reduced by 5 to 15 years (Canadian Diabetes Association, 2016).

Previously considered an adult disease, T2D is more and more frequently found in children, whose diabetes complications will likely be more severe than complications of those who acquired diabetes later in life (Strachan, 2012). While it is possible to manage diabetes through weight loss and associated lifestyle changes, many complications have no cure. For example, people in the late stages of chronic kidney disease need to go on dialysis or get a kidney transplant to stay alive ("Key Points: Living With Stage 4 Kidney Disease", 2014).

One of the main studies that looks into to finding effective interventions for people with T2D is the Diabetes Prevention Program (DPP). The DPP randomly selected 3,234 participants with prediabetes and by organizing them into 3 into different treatment groups, the study found that modest weight loss through dietary changes and increased physical activity was the most effective strategy reducing the risk of diabetes by 58% (Diabetes Prevention Program Research Group, 2002). Furthermore, a more recent study goes as far as to suggest that diabetes is reversible in a relatively short period of time of 8 weeks by introducing dramatic changes in diet (a 600 kcal)/day diet[18]). The study participants had a relatively short duration of T2D (up to 4 years) (Lim et al., 2011). Consistent with the idea of reducing energy intake, bariatric surgery (reducing stomach size) has proved to be an effective medical intervention. Despite some health complications that can occur, the benefits of this procedure are well-documented and it is referred to as a "successful, validated, legitimate treatment for an otherwise intractable disease" (Keidar, 2011). In Adams el al (2007) it was shown that surgery has lowered diabetes-related mortality by 92%. Nevertheless, healthy diet and exercise are still required after the surgery ("Weight loss surgery and type 2 diabetes," 2005).

These studies carry two important messages. First, weight loss is critical. In this context, it is important to mention that the obesity risk factor increases on-reserve.[19] Therefore, lifestyle changes such as low-calorie diet and exercise would be a promising strategy to follow. Second, these successful interventions have dealt with patients at the early stages of T2D or with prediabetes. Consequently, early screening and intervention is important to avoid the many high costs that occur as a result of having to treat diabetes complications. It is crucial to focus prevention on obese children, adolescents, and adults as well as pregnant mothers (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). It has been found that children born to mothers with Type 2 inherit the gene for lower secretion of insulin, so they have an additional inherited inability to make insulin (Strachan, 2012).

Diabetes Statistics and Costs

Poorly managed diabetes leading to complications has a great impact on both individuals and the economy as a whole. The number of patients and the costs are startling. It was estimated that in 2010 that the cost of diabetes for the Canadian healthcare system and economy equaled $11.7 billion, with complications accounting for over 80% of the total (Canadian Diabetes Association, 2011, p. 2). Similarly, at the level of the province, the diabetes prevalence rates and costs are substantial and continue to grow. In "Diabetes in Manitoba 1989 to 2006" (2009) it was estimated that given the same prevention efforts,

TABLE 8 Patients on Register at the GH Nursing Station – August 2015

Chronic Care Program (Pediatric)

	Total	Asthma	Diabetes	Cardiovascular	Renal	Autoimmune	Other
Total # of Patients[20]	112	29	23	19	9	28	22

Chronic Care Program (Adult)

	Total	Asthma	Diabetes	Cardiovascular	Renal	Autoimmune	Other
Total # of Patients	706	79	461	429	75	89	0

SOURCE: Month End Submission for GHFN Nursing Station

TABLE 9 The Number of Patients With Diabetes and Cardiovascular Disease, in Dynamics, 2015

Diabetes Dynamics, 2015

	Jan	Feb	Mar	April	May	June	July	Aug
Pediatric:	24	24	24	24	21	21	28	23
Adults:	442	445	445	448	458	459	459	461

Cardiovascular Dynamics, 2015

	Jan	Feb	Mar	April	May	June	July	Aug
Pediatric:	22	26	26	26	20	20	20	19
Adults:	420	415	414	415	428	427	427	429

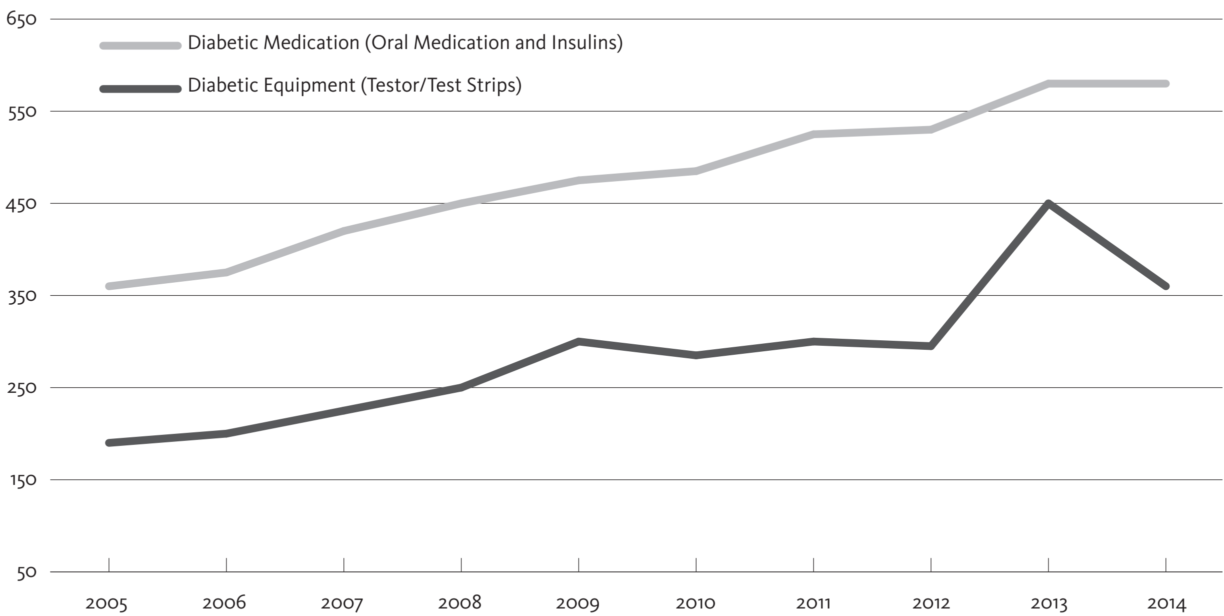
SOURCE: Month End Submission for GHFN Nursing Station

obesity levels and unchanging incidence rates the number of Manitobans diagnosed with diabetes would rise to 111,000 by 2016. In 2016, however, it was found that the number of Manitobans diagnosed with diabetes in fact equaled 121,000, which exceeded the original projection by 9%. If prediabetes is included, then we are seeing even more worrying statistics — 373,000 people or 28.1% of the population — which means that at least every 1 person in 4 is either at risk or lives with diabetes (Canadian Diabetes Association, 2016). The cost to the province was estimated to be $498 million in 2010 (measured in 2009 dollars) which is expected to reach $639 million by 2020 ("The Cost of Diabetes in Manitoba", n.d.).

The Indigenous population is one of the ethnic groups that carries a heavier burden related to this disease. It has been consistently reported that the national age-adjusted prevalence of diabetes among the Indigenous population is three to five times higher than that of the general Canadian population (Canadian Diabetes Association, 2015, p. 21). Similarly, complications are said to be found more often with the Indigenous population than in the non-Indigenous population (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). Furthermore, Indigenous individuals are generally diagnosed at a younger age than non-Indigenous individuals, and Indigenous females experience higher rates of gestational diabetes than non-Indigenous females (Public Health Agency of Canada, 2011).

While being a problem of considerable magnitude at present, diabetes in First Nations communities is a fairly recent phenomenon. Before 1940, there was no evidence of diabetes among Indigenous groups in Canada ("Facts & Figures:

FIGURE 5 **NIHB: Number of Distinct Claimants. GHFN 2005–2014**



Diabetes", n.d.). Dr. Heather Dean had first documented diabetes in children in Northern Manitoba in the early 1980s (Strachan, 2012). Now we can even observe increasing rates of T2D in children.

GHFN hasn't escaped the diabetes epidemic. Table 8 describes the number of patients from six categories of chronic care program at GHFN Nursing Station, including diabetes.

There were 461 diabetes patients in adult care and 23 patients in pediatric care in GHFN in August, 2015. Over the course of eight months (from January to August 2015) the number of adult diabetes patients increased by roughly 4%, whereas the number of diabetes patients in pediatric care has remained relatively stable, although it is not showing the desired downward trend. The number of cardiovascular patients in adult care has increased by 2%. This statistic points to already astonishing numbers that, nevertheless, continue to grow. For the community of 3900 people,[21] the number of diabetic patients constitutes 12% of the total number of people (whereas provincially, in Manitoba this share equals 9.1% (Canadian Diabetes Association, 2016). This is consistent with national and provincial observations that document and project the rising diabetes prevalence rates (Canadian Diabetes Association, 2011; "Facts & Figures: Diabetes", n.d.). It is important to mention that due to limited access to screening and lack of surveillance data, this statistic doesn't include people with prediabetes, so that the total impact of this health issue on the community is underestimated.

In order to determine the costs of diabetes in GHFN, a request was submitted to Health Canada under the Access to Information Act. They were asked to release the information on the amounts allocated by the Non-Insured Health Benefits (NIHB) Program[22] for diabetes medication and equipment in GHFN, and for transportation to Winnipeg to access medically required health services not available on reserve. Moreover, they were asked to state the number of people receiving those benefits. The responses are to be found in Table 10.

From Table 10 (page 23) it can be seen that the number of distinct claimants of diabetic medication (oral medication and insulins) is

TABLE 10 **Non-Insured Health Benefits Program Expenditures for Diabetes. GHFN, 2005–2014**

Diabetic Medication (Oral Medication and Insulins)	Calendar 2005	Calendar 2006	Calendar 2007	Calendar 2008	Calendar 2009	Calendar 2010	Calendar 2011	Calendar 2012	Calendar 2013	Calendar 2014
Distinct Claimants	360	379	423	459	485	498	532	538	585	589
Amount Paid	$148 289	$178 628	$202 701	$201 958	$206 300	$209 037	$221 231	$230 899	$237 496	$243 012

Diabetic Equipment (Testor/Test Strips)	Calendar 2005	Calendar 2006	Calendar 2007	Calendar 2008	Calendar 2009	Calendar 2010	Calendar 2011	Calendar 2012	Calendar 2013	Calendar 2014
Distinct Claimants	193	195	230	260	306	287	305	300	461	360
Amount Paid	$47 733	$51 051	$58 473	$72 553	$77 834	$74 350	$78 353	$77 281	$81 450	$70 969

Total Paid (Medication and equipment)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	$196 022	$229 679	$261 174	$274 511	$284 134	$283 387	$299 584	$308 180	$318 946	$313 981

higher that the number of people registered at the nursing station. In 2014 there were 589 distinct claimants which forms around 15% of the GHFN population. Figure 5 is based on the data obtained from Health Canada, and it shows a clear upward trend in the number of NIHB claimants over the past 10 years (with an average growth rate of 6% every year).

The total cost to government (NIHB program) for diabetes medication and equipment has also been increasing steadily with an average growth rate of 6% and equaled $313,981 in 2014. The cost per patient has remained relatively stable throughout the period.

Apart from those two categories of costs, the government health program also pays for transportation of diabetes patients to Winnipeg to access services that are not available on reserve. According to Health Canada, to maintain cost effectiveness, the region will try to coordinate multiple appointments before a client travels from the community. Information in Table 11 is provided for coordinated appointments and single appointments. The Government spent $178,313 for single endocrinologist appointments in 2015 and $197,671 in 2014.

Another major cost to government in connection with diabetes is the cost of operating the Dialysis Unit located in GHFN. This provides hemodialysis[25] to the patients from across the Island lake communities (Red Sucker Lake, GHFN, St Theresa Point, Wasagamack). The Dialysis Unit has the capacity to accommodate 18 people and as of April 2016 it is operating at full capacity with a waiting list of 31 people. People on the waiting list are all receiving their treatment in Winnipeg. Health Canada pays for relocation (accommodation, meals, transportation) for the first 3 months and after that it is the responsibility of the patients to find their own accommodation.[26] Sometimes the Dialysis Unit offers transient spots for people who are permanently living in Winnipeg to come to GHFN for a few days to visit their family or for a special occasion like a wedding or a funeral. In total it costs $1.7 million to operate the unit annually. Therefore, the annual cost of treating one patient on dialysis equals approximately $95,000.

Government also provides a diet supplement for diabetic patients. The diet can vary according to a person's age, sex, activity level, current weight, and body style. As noted in Norman (n.d.) in order to promote weight loss, patients with T2D are generally put on a 1,500 to 1,800 calorie diet per day. However, more calories per day are needed for more obese individuals initially.

TABLE 11 **Medical Transportation Costs — Endocrinologist Appointments. Apr. 1, 2008–Dec. 15, 2015**

Fiscal year of appointment	# of appointments	Estimated Cost**	# of appointments with a transportation cost	Estimated Cost for appointments with transportation cost
2008/09	81	$72 017	79	$72 017
2009/10	109	$107 197	107	$107 797
2010/11	**125**	**$115 652**	**122**	**$115 652**
2011/12	**139**	**$76 905**	**81**	**$76 755**
2012/13	158	$112 600	105	$111 012
2013/14	190	$197 671	188	$197 605
2014/15	164	$178 313	160	$177 244
2015/16	84	$75 155	65	$74 661

** Single Endocrinologist appointments ONLY does not include coordinated appointments
** paid costs only until about October 2015
** note: transportation costs can include: air travel, meals and accommodation
** note: when an escort is required paid costs are included (note: approximately 30% of single endocrinologist appointments include and escort)
** does not include: in-city transportation, unpaid transportation/meals/accommodation (client or band paid)
** Destination of Appointments = Winnipeg
** unable to get data prior to 2008 due to system upgrade

TABLE 12 **Summary of Diabetes Costs for GHFN, 2014 Calendar Year**

Category of Costs	Amount, CAD
NIHB: Diabetic Medication and Equipment	$313,981
NIHB: Transportation Costs for Single Endocrinologist Appointments	$197,671
Dialysis Unit	$1,700,000
Subtotal	**$2,211,652**[23]
Diet supplement (diabetes)	$392,000
Total	**$2,603,652**

Since the rates for diabetic diet supplement span over 13 different calorie levels — from $27.27 per month for 1000 kcal diet to $171.49 per month for 3000 kcal diet — we will attempt to calculate the total assistance amount based on an average standard 1,800 calorie diet which implies an additional $67.49 per month to the basic social assistance. This way, we arrive at $392,000 in diet supplement payments per year for all diabetic patients in GHFN.

There are a number of other costs related to diabetes, for example cost of doctor appointments, out-of-pocket spending of diabetic patients, loss of employment and productivity. Due to the breadth and complexity of these costs combined with limited access to information and complications in obtaining specific patient data, they are not examined in this paper.

Nevertheless, the costs found in this paper are impressive (see Table 12) with at least $2.6 million/year spent on diabetes in GHFN. This poses a serious problem for the community and calls for urgent action. The next section will use some of the findings about successful prevention and costs to give a preliminary assessment of why effective diabetes management is failing in the community at the level of primary care and support systems.

Discussion

Knowing the chronic nature of disease, the seriousness of its complications and the large number of people who are affected in the community, it comes to no surprise that government spending on diabetes treatment is significant. It is not, however, sufficient to ensure prevention and provide quality care for everyone.

There are a number of administrative and financial gaps that stand in the way of successful diabetes prevention at the level of health care provision. First of all, even though regular screening, follow-up, and surveillance of individuals with prediabetes are necessary for effective intervention, the nursing station has no record of patients with prediabetes. Due to a shortage of funding, medical facilities are overloaded and it is difficult to follow up with each and every patient.

> "On the system's approach, so you screened everyone (they screened the whole school one year) for kidney disease, high blood pressure, obesity and the amount of high blood pressure and kidney problems were so high the system couldn't deal with it."
>
> *Jon McGavock, Research Scientist, Children's Hospital Research Institute of Manitoba.*

In high risk First Nation communities, screening should take place from early childhood (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). Despite this recommendation, there are significant gaps in surveillance information related to diabetes in the Indigenous populations (Canadian Diabetes Association, 2015, p. 21). However, the efficiency of health care provision in First Nations is a subject for a separate thorough investigation.

Second, as it relates to the previous argument, not identifying this critical category of people with prediabetes leads to ill-considered resource allocation, as in the case of the diabetes diet supplement. Providing after-diagnosis assistance to people with T2D to increase their consumption of healthy food might slightly increase their disposable income, but there is no evidence that this is a sufficient and effective measure to help people in the North achieve a healthy diet, or that it helps reduce the diabetes epidemic.

> "The supplement that they give from the social assistance is for the people who have diabetes; for them to buy healthy food. But that's not usually the case."
>
> *Lionel Flett, ADI worker, Nursing station*

The idea that people don't make the right choices and don't spend money available to them on healthy food recalls the results of the national survey prepared for The Canadian Diabetes Association by Environics Research Group in 2011. The survey sought to discover the public perspective on diabetes (factors driving increasing rates of T2D, factors contributing to their risk of being diagnosed with T2D, factors driving risk of complications for people living with diabetes, etc.). The results revealed that in the opinion of the general public the responsibility for diabetes resides with a person's own decision to live an unhealthy lifestyle. Even though institutions such as the government, the food industry and the health care sector were often recognized as playing a significant role (advertising and selling of unhealthy foods, failing to help patients prevent the onset of T2D), personal choice emerged as a leading contributing factor to diabetes.

The results of the poll are important because they reveal society's general attitudes and, therefore, the way we talk about the issue and how we deal with it. This echoes the idea mentioned in another study (Socha et al.,, 2012, p. 8) that the problem of ill health "is often framed in government solutions as a matter of individual choice". Particularly in the case of remote northern communities like GHFN, the context within which individual choices have to be made when it comes

to maintaining or improving one's health condition, is commonly overlooked.

> "Those are the messages that we put out as experts... diabetes is preventable, obesity is preventable and you have to make good choices.... We don't ever talk about how people's bodies are different, people are within these very broad complex systems, we don't talk about the food industry and the money that people have and how that influences what we buy and government policies.... We assume that people have disposable income, ability of people to get to places where the best food is, time to make it. We don't ever talk about the context of food but we expect people to navigate in this entire complex environment. We make it sound like it's easy, yet it's not."
>
> *Dr. Sharon Bruce, Associate Professor, Community Health Sciences, University of Manitoba.*

Personal choices can only be said to be the leading cause of diabetes when there is a culturally supportive environment in place that successfully addresses many of the social determinants of health first — food security, unemployment, housing and living conditions,[24] barriers to health care access, early childhood development and many others. Moreover, knowing the history of oppression and cultural disintegration of Indigenous communities, there needs to be a strong awareness of mental, spiritual and emotional aspects of health, for example through connection to traditional foods, when expecting considerable improvements in the health status of any Indigenous community.

As far as a healthy diet is concerned, it was discussed earlier that weight loss due to low calorie intake is a major component in prevention. However, the institutional set up will determine whether people will follow through with the recommendations at the appropriate time.

> "If there is not enough food in the house 5 days of the month, telling people to eat differently is not going to work. So food insecurity is the biggest problem to prevention."
>
> *Jon McGavock, Research Scientist, Children's Hospital Research Institute of Manitoba.*

Solving food insecurity by providing access to healthy, affordable and culturally appropriate food alone will not address all the problems but it is necessary if the well-being of people who find themselves living in atrocious conditions of poverty and malnutrition is to improve. There are a number of economic and educational initiatives that have already been introduced in GHFN in order to promote healthier lifestyles. Although still in their initial stages, some of them recognize the need for structural changes to address food insecurity and are aimed at building a local food economy. Improving the life of the GHFN community residents is a demanding long-term task with many aspects to consider — cultural, historic, financial and administrative, to name a few. The next section will discuss these initiatives, uncovering details about their operation and the main challenges they face, and will assess the potential they have to contribute towards building a healthy community.

Food Programs: Addressing Food Insecurity Through the Model of Social Enterprise

Social Enterprise (SE) is a form of business that is known to use commercial strategies to advance social, environmental and human justice agendas such as providing an important service, creating employment, and reducing poverty ("What is a social enterprise?", n.d.). The new SE in GHFN is Meechim Inc., run by Aki Energy Inc. which focuses on providing affordable food and improving the health status of the community members. The goal is to produce locally at the farm situated on reserve, sell the produce at a local market at prices lower than at the Northern Store, and to potentially introduce more initiatives that would increase healthy food consumption in the future, like a healthy food café. The SE strives to meet the needs of the community (the lack of healthy affordable food, lack of employment opportunities) through the use of local resources (use of the reserve land to farm, hiring locals for the positions in farming, production, delivery, and administration). Likewise, reducing the rate of diabetes in the community is a key element of their mission (Loney, n.d.).

Overall, Meechim Inc. aims at introducing, promoting and strengthening some of the important principles of community economic development (CED), such as production of goods and services for local use, local re-investment of profits, long-term employment of local residents, local skill development and local decision making ("Community Economic Development Guiding Principles", n.d.). The economic rationale for this strategy is well demonstrated in Loxley et al., (2007): "these principles are rooted in what we would call a "convergence" approach to economic development, by which we mean that, rather than looking beyond the community for development, CED seeks to produce to meet local needs, to hire locally, to purchase locally, to invest locally, and thus to create internal rather than external economic 'linkages' " (p. 7). Therefore, the long-run benefit of Meechim Inc. is development of the local economy and ensuring that "money spent on meeting people's needs stays in the community" (Aki Energy, 2015). Additionally, this economic strategy is expected to foster a sense of responsibility for the community's future among its residents and engrain the "we-can-do-it" mentality in the community that found itself in egregious conditions of poverty and that, according to the opinion of one community member, seems to be losing hope.

However, given the size of the community, the irregular healthy food market dates and, for the

time being, limited potential of the Meechim Inc. to provide healthy food for all, GHFN residents will continue to buy food at familiar places such as the Northern Store. It is common to shop there not only because there are few alternatives, but also because the Northern Store offers a number of important services besides selling food, such as transferring money from South to North for families. Since it will remain a major food provider in the near future, it is important that the initiatives to promote healthy living are also actively developed and introduced there. The Northern Store has been receiving the government subsidy on selected healthy food items under the Nutrition North Canada Program (NNC) which applies to the freight costs of foods shipped in and which generally results in lower food prices. The North West Company which owns the Northern Stores across the country has also run a few of their own initiatives in GHFN that will be discussed further. However, whether there is a potential to effectively deal with the problem of malnutrition though the Northern Store business model without any major structural changes is questionable. It is, after all, first and foremost in business to make profit and if the profit is to be found in chips and coke, that's what it will sell.

This section will critically examine the initiatives already underway in GHFN. The programs will be reviewed to ensure that the complex interventions in the community are understood; their scope, amount of investment and number of people involved will be described, wherever possible. As far as Meechim Inc. is concerned, this section will assess this initiative's potential and offer recommendations for both government and entrepreneurs involved in the initiative to help ease the barriers impeding the program's success.

The following review has been divided into two parts. First it will look into the programs that try to deal with the high cost of food and, second into the programs whose sole purpose is to educate about healthy eating and it benefits.

Food Affordability and Accessibility

North West Company

The Northern Store has continuously been regarded as having many adverse impacts on food security and sovereignty in the northern hard-to-reach communities. For example, Thompson et al., (2012) found that the Northern Store has produced negative impacts on a number of the livelihood categories such as financial, natural, physical, human, and social capital, food sovereignty, and food security. However, recently efforts have been made to improve the image of the company by introducing a number of programs focusing on food affordability and the benefits of healthy eating.

One of the measures that the Northern Store has adopted for food affordability and accessibility is highlighting, through in-store signage, the savings to customers of the NNC subsidized goods. As mentioned earlier, the NNC program has introduced a subsidy towards the freight costs of selected imported food items (mostly nutritious perishables) shipped to the remote northern communities. GHFN is one of the eligible communities. Therefore, retail businesses such as the Northern Store are eligible to receive the subsidy of $1.60 per kg of the imported item ("Eligible communities", 2016). Between April 1, 2014 and March 31, 2015 the program subsidized 635,680 kg of food in Island Lake (GHFN) for a total of $915,275 ("2014–2015: Full Fiscal Year"). Although the goal of the program is to make the prices of imported food items equal to those in Winnipeg, the statistics for the Refined Northern Food Basket (RNFB) show that prices seem to have dropped significantly only in the first year after the launch of the subsidy. The cost of the RNFB had dropped from $424.67 in 2011 to $367.84 in 2012 (reduction of 13%). In the subsequent years, however, the prices were steadily growing up (up to $401.41 in 2015). Although we can still observe a reduction of 5.5% in the RNFB compared to March 2011 (the year when the program was introduced) ("Cost of the Revised

Northern Food Basket in 2014–2015", n.d.), and some community members have indeed pointed out that a few selected items have decreased in price, overall, evidence of a significant positive impact is hard to see with the cost of the RNFB continuing to grow. Evidence of price reductions is not consistent and the program clearly falls short of its objective to make the prices of imported food items equal to those in the South.

In addition to participating in the NNC program, the North West Company is involved in the breakfast program in partnership with the Breakfast Clubs of Canada and Minute Maid, which supplies Minute Maid apple and orange juice to 13 schools in nine northern communities, including GHFN. As part of this program the North West Company provides the storage facilities and assumes the freight costs of the item delivery (Graham, 2015). The North West Company also supplies 2 pallets of breakfast cereal (Post Honey Bunches of Oats) to the school in GHFN with the first shipment received in March 2016.

The North West Company has also launched The Healthy Horizons Foundation which is meant to financially assist northern communities with programs targeted at youth that will positively affect their health through nutrition, physical activity and learning.

Furthermore, from phone conversations with the North West Company's director of business development, it was learned that the company has some interest in understanding the health needs of the community. It has engaged in the pharmacy partnership with Manitoba Keewatinowi Okimakanak Inc. (MKO) to supply medicine to the costumers of GHFN. Moreover, they have an interest in launching diabetes screening clinics in the future.

In sum, even though the North West Company may be invested more heavily in alleviating food insecurity in other communities, their efforts in GHFN are scarce and do not extend beyond the NNC and the breakfast program, which exhibits a fragmented approach to the problem of malnutrition. Providing young children with free snacks should be encouraged, however it is a one-time action and the health benefits of the sugar containing items such as juice and cereal are disputable. It is critical to remember in this case that any support, however targeted, will nevertheless be coming from an entity that is controlled by non-residents of the community and it will only have a limited incentive to significantly challenge the status quo.

Meechim Inc.

Given the lack of opportunities to reduce food prices though the traditional model of importing food from the South, more innovative ways of dealing with the issue have emerged. After having experienced the success of another project that involved doing energy and water retrofits on the most energy-inefficient homes of low income people, the entrepreneurs at Aki Energy have decided to expand their social enterprise to focus on food sustainability. They have created Meechim Inc.[27] in GHFN. It currently consists of Meechim Farm, Meechim Healthy Food Market, the Canteen at the Arena and the School to Farm Program. Their approach has adopted many of the guiding principles of CED with an overarching goal of ensuring the local control of food production and building the local food economy.

In the fall of 2014, GHFN cleared 13 acres of land[28] on the outskirts of the community, and in the spring of 2015, Meechim farm had begun its first planting season (Aki Energy, 2015). In summer 2016, the farm continued its operation and for the second year in a row the workers at the farm are growing vegetables (potatoes, turnips, carrots, squash, beans, lettuce, corn, tomatoes), and raising chickens.[29]

The Province of Manitoba Northern Healthy Food Initiative (NHFI) provided the start-up funding of $300,000. To put this number into perspective, it constitutes one third of what the NNC program annually allocates in subsidy

amount for GHFN. In 2016 an additional $97,000 has been obtained from a few different funders such as NHFI, Aboriginal Economic Development Fund (AEDF), Canadian Feed The Children.

At present, Meechim Inc. has created 10 jobs for community members.

The Meechim Healthy Food Market sells both food grown at the farm and food imported from the South at prices lower than the Northern Store. By organizing the market on reserve, the initiative is also trying to decrease expenditures of customers on transportation. The market has not been operating regularly due to review of the strategy and to internal reorganization, but the leadership is planning to run it a few times a month after the necessary arrangements are made to secure a venue and protect it from being vandalized.

Attempting a previously unexplored area of business is risky and if the market is not well studied, this can result in financial losses. First Nations communities in general have had many different types of interventions and initiatives coming into their communities. The road is littered with failed programs. It is important to carefully study the new market and ensure that the connections are made with the community members so they are supportive of the initiative. The project organizers are learning as they progress, and some challenges have surfaced along the way. This is to be expected. Some of the insights on the functioning of the new SE and its challenges are discussed below.

- Relationship building is a challenge for such a large community as GHFN. Despite having the former chief of GHFN as the Executive Director and co-founder of Aki Energy and having the approval of Chief and Council, the social enterprise was introduced with only a limited community involvement. Even though this social enterprise intends to have community members' best interests in mind, having people define what development means to them is what makes a true community economic development initiative (Loxley et al., 2007, p. 6).
- Once introduced, the ways of communicating about this new healthy food opportunity to the residents were not well defined. As the result, anecdotal evidence exists that the farm was detached from the community, at least in the first summer of operation. Teachers and students at the local school and workers at the nursing station were unaware of the farm.
- Meechim Inc. hasn't been actively communicating with the leadership of the community. Following 5 months after the leadership change, contact with the new chief hasn't been established. The communication with the Chief and Council is maintained through one councilor.
- There is no sustained funding for the enterprise at the moment. Therefore, the lack of communication and the community involvement at the planning stages of the SE can in part be attributed to the shortage of funding that is needed to engage in broad market analysis and consultations. As a SE, Meechim Inc. is trying to gradually cease reliance on programs and become a self-financing business. However, it may not be possible in the earlier stages.
- The first year after the locally raised chickens were slaughtered at the farm, the Healthy Food Market faced difficulties selling the produce to community members. The lack of consumer education might have been responsible for the low sales of the chicken. According to the ADI worker Lionel Flett people "just think they weren't properly handled".
- The soil in GHFN is not fertile and needs fertilizers, which is an additional cost.

- Since the community members' incomes are low, Meechim Market has to adapt to the days when community members are most likely to have money (welfare payment days). Sometimes it is hard to adapt to this schedule because the administration can change the rules when they get pressure from people.
- If the weather conditions are not favorable, the market cannot be held as planned and the imported food can spoil (Food Matters Manitoba, 2016).
- The Northern Store lowers its prices during Meechim Market days, increasing competition.
- Initially it was estimated that the enterprise would be able to offer 25 jobs (Loney, n.d.), however it was only able to offer 10 positions.
- According to the student researcher who has been heavily involved with the work of the farm at the first year of its operation, there is a lack of accountability and management skills in the work of the farm and market personnel. Employees can easily steal the produce without anyone noticing. Business tactics might need to be integrated in order to prevent theft such as allowing workers to have discounts for the items they sell.

Some of the above challenges have already been addressed, such as:

- An advisory board for Meechim Inc. has been created which consists of 6 community members including one councilor, and one person from Aki Energy Inc.
- The effective solution has been found for the poor soil quality. 6,600 lbs of fish have been purchased from the local fish plant to use as a soil fertilizer (source: Aki Energy Inc. Project Status Report, April 2016).
- To prevent theft, a shipping container was retro-fitted to be a permanent market structure for the Healthy Food Market.
- In order to increase the awareness of the healthy food options offered by the farm, the new School-to-Farm program has been initiated which educates youth about gardening. The children from grades 3 to 6 plant vegetables in pots in their classrooms, which they later they plant at the farm and have a feast when the vegetables are grown.

Although progress is being made, the initiative is yet to develop their business strategy to address all the aforementioned challenges (e.g. provide better training to the local staff, advertise at the big annual community gatherings, supply food on time for the events such as hockey games at the arena). Once improved, it is hoped that the model can be replicated to other communities.

Wabung[30] Fisheries Co-op

Another SE in GHFN is the Island Lake Wabung Fisheries Producers Cooperative Ltd. (Wabung). The Garden Hill Fishers Association (GHFA) first established a fishing cooperative in 1995 when the government granted the Island Lake Nations' fishers a license to harvest and export fish commercially to other provinces in Canada (Thompson et al., 2014). Initially the cooperative ran under the name Island Lake Opakitawek Cooperative (ILOC). In 2014 it had approximately 50 fisher members (Thompson et al., 2014). The biggest physical asset belonging to the cooperative is a fish-processing plant that is located by the lakeshore on the outskirts of the community.

The change in the cooperative's operation occurred when new government rules required the fish to be processed by Freshwater Fish Marketing Corporation (FFMC) before exporting outside the province. Such restrictions granted a monopoly to the FFMC and prevented fishers of GHFN from exploring diverse marketing options. The fileting operations ceased and the processing plant closed for many years. After the plant

had closed, fishers were faced with higher transport costs as they had to transport the whole fish (Thompson et al., 2014). Thompson et al., (2014) found that commercial fishing and selling of the unprocessed fish at GHFN was unprofitable. Fishers experienced the loss of $3.18 per kg of fish sold due to high shipping costs, low prices received and lack of planning and resources to make improvements.

Moreover, government policies restricted the plant from selling the freshly caught fish locally (at school or at any community event) unless it was inspected by federal officers from Freshwater Fish Marketing Corporation (FFMC).

Recently, however, Wabung Fisheries received a special dealer's license from FFMC that allows them to process the fish they catch. The plant reopened in September 2015 (Tides Canada, 2015). In September 2015 when the researcher visited the plant, it employed 3 people and was in the process of hiring more staff.

Now the fishers are in need of funds to upgrade their facilities, purchase and upgrade refrigerants, ice making machines, carts on rails, sanitizers, and water pumps. At the sharing circle discussion attended by the researcher, fishers talked about the lack of proper equipment to fish and financial difficulties in sustaining their traditional livelihood. It was estimated by one stakeholder that the plant would need an additional investment of approximately $100,000 to buy all necessary equipment in order to process fish. In 2014 the plant received $22,000 in grant money though their partnership with the Northern Manitoba Food, Culture, and Community Fund (NMFCCF) at Tides Canada, and $35,450 in 2015.

With the FFMC dealer's licence, Wabung Coop could sell fish directly to local residents through Meechim Inc. Moreover, Wabung Co-op sold some whole and filleted fishes to Winnipeg farmers markets, engaged in direct internet marketing and sold to restaurants and retail stores in Winnipeg (Rony, 2016). Selling without the intermediary ensured better returns for the fishers than selling wholesale (Rony, 2016).

However, getting a decent market share while competing with the experienced producers (e.g. Gimli Fish) can be challenging. Finding the target market on their own will require better marketing tools and skills among the members of the cooperative, especially knowing that the buyers are limited.

It is important that the Wabung Coop find a stable long-term buyer in order to maintain an influx of money and develop a solid capital base (Rony, 2016). FFMC is that buyer. In the fall 2015, the Wabung Co-op supplied 200,000 lbs of mainly pickerel to FFMC. Manitoba's recent proposal to withdraw from FFMC (Annable & De Pape, 2016) may deprive the cooperative from the advantage of having this stable long-term buyer.

A carefully developed business plan is needed to address all of the marketing challenges. The initial business plan was developed and revised by the researcher Mohammed Rony and Dr. Shirley Thompson in 2014 and 2015 (Rony, 2016; Thompson et al., 2014).

Backyard Chicken Raising

The backyard chicken project is part of the food security program at the Four Arrows Regional Health authority with core funding being provided by the NHFI. The program hopes to empower people of Island Lake (which includes GHFN) to produce food locally. To that end they are trying to provide training needed to engage community members in small-scale gardening and farming.

The chicken raising program follows a five-year plan. The first year the program covers 100% of the costs (coop, 20–25 meat birds, feed). Everything is prefabricated down South and later transported via winter road. At the end of the season families slaughter and eat the chickens they have raised. The second year the program makes new supplies, however the families are encouraged to pay for at least 50% of their feed. The third year, the families are expected to buy their own feed

and start paying for the chickens. In the fourth year the families become experienced enough to provide support and educate the families that are just starting with the program. Families can keep chickens over the winter and proceed with incubation. Support from the program organizers is available all year round over the phone.

Since the program was introduced in 2011, a total of 12 families have been involved in the Island Lake region, including 4 families in GHFN. The success rate for the birds was 50%, with predation being the main cause for the losses. There was one family with layers, but no family had moved to incubation.

One fully insulated coop costs $2,000. In addition, it costs $3,000 per one trip to deliver the supplies to the communities via winter road. The costs of setting up local small-scale farming can rise unexpectedly, that is why the planning stage is crucial for the success of the program. According to the program coordinator, a 40 lb. bag of chicken feed can cost $10 in the South, however the price can increase to $80 if delivered to the community by plane.

The relevance of this program to the traditional food and culture is explained in the following way:

> "I do believe that the chickens we are doing now is not appropriate. Appropriate meaning it is not natural. But nowadays our people love chicken. And going to back the land we do have birds like ruffed grouse, they are called wild chicken. Particularly the migration road is in the Red Sucker Lake. We have those birds and we also have white ptarmigans. They are there all year round. Therefore, there is chicken activity in our communities. But now we are domesticating everything, so that's why I thought we should introduce our local chicken to alleviate some food insecurity problems."
>
> *Byron Beardy,*
> *Community member and Food Security Coordinator,*
> *Four Arrows Regional Health Authority.*

The program cannot, therefore, be said to maintain historical traditions, but rather introduce new practices. Even though the program is believed to pass down the knowledge of farming to the community through continuous training and support for the participants (e.g. program organizers are creating a chicken raising manual), the potential to significantly alleviate food insecurity though this program is limited. Significant scaling up may not be possible for a number of reasons. First of all, there is a lack of demand for this kind of activity among families. Second, the limited funding can only support a few families.

Lunch Program at School

Because of the scarcity and high prices of healthy food, it is a challenge to offer nutritious meals to the children at the local school. The lunch program offers meals at lower prices than if the food was purchased by families and prepared at home, and it gives parents a good opportunity to ensure their children are not hungry and ready to learn. However, according to one community member, most of the food offered by the program cannot be referred to as healthy.

> "In the lunchtime they don't usually eat healthy because they have hotdogs, burgers, stuff like that. Same thing with the lunch program, they don't have enough money to feed the 600 kids, it will cost more money to buy healthy foods."
>
> *Lionel Flett,*
> *ADI worker, Nursing station*

There are other examples of the unhealthy food choices at the school lunch program. The dietician working in GHFN observes that the children at the school usually have orange juice for both breakfast and lunch, whereas the recommended serving is one tetra pack (half a cup) per day. Therefore, the lunch program, although making sure the children do not stay hungry, will require revisions and need to find solutions to the problem of purchasing healthier foods.

Education

Nutrition North Canada

In GHFN the NNC educational program is funded directly to the community. The goal is to promote awareness about healthy eating, especially among the younger population. Examples of their educational initiatives in 2014 are: vegetable discovery day in 20 classrooms, traditional food preparation workshop guided by Elders (in total 4 workshops which involved 221 participants) (FourArrowsRHA, 2015). In addition, the school has set up the mentorship program where high school students mentor the elementary school children. After school they provide healthy snacks (milk, fruits) to the younger kids and play games.[31] Grocery store tours with a dietician are another educational activity. The tours provide gift cards for participation and pay for transportation. From the conversation with the dietician it was found that the attendance was 8 people in October 2015, 6–5 people at the next tour in January 2016. Additionally, cooking classes are offered on a regular basis, usually every Friday.

School-to-Farm Project

This project is part of Meechim Inc. which teaches children from grades 3 to 6 about gardening. They plant vegetables in the pots in their classrooms, which they later they plant at the farm and have a feast when the vegetables are grown. The program started in 2016.

Drop the Pop

"Drop the pop" is the initiative of the Kidney Foundation of Canada that aims to educate young children about the dangers of sugary drinks. A grant of $250 was given to Kistiganwacheeng Elementary School in GHFN in 2014 for the Drop the Pop challenge. Schools challenge students to avoid drinking sugary beverages for five consecutive days (Kidney Foundation of Canada, Manitoba Branch, n.d.).

Aboriginal Diabetes Initiative (ADI)

Cooking classes are offered at school 2 times a year for the children in grade 5 for the duration of 4 classes. Approximately 48 children participate.

Discussion

The healthy food initiatives in GHFN comprise efforts targeted at food availability and affordability as well as education. It important to note that many programs serve more than just one purpose. By having food affordability as their main purpose, some programs like Meechim Farm and Market are also localizing food systems and providing training opportunities through the local farm, individual gardening, and fishing, making a step towards a convergent economy. In case of educational programs, they bring people together to support one another and by making those gatherings entertaining and social they are becoming not solely about education, but also about mental wellness.

Initiatives focusing on food affordability though localisation of the food systems include 2 social enterprises which employ at least 13 local people with the potential to offer more jobs. To date at least $465,000 has been invested in the projects that promote local healthy food production, not to mention about $1 million annually in NNC subsidy for the imported healthy foods at the Northern Store.

Although there is still a great reliance on the Northern Store, we can observe a positive trend of self-determination and local control of the food systems manifested in Meechim Inc. and Wabung fisheries co-op. Nevertheless, these social enterprises are yet to expand sufficiently to be able to offer enough food for the community. For example, at the end of the 2015 farming season, approximately 600 chickens had been slaughtered at the Meechim Farm. Dividing by the number of families in private households[32] results in an average of one chicken per family. The similar concern has been raised in Das

(2016). If the national average for chicken consumption per person is considered, the GHFN chicken production needs to be increased dramatically in order to accommodate this standard. To add to the challenge, the families were reluctant to buy the Meechim chicken for fear it hadn't been properly handled.

Therefore, educational programs have to accompany the changes in food production to provide understanding of the actual risks and benefits of the new food options. People have developed a habit of a certain diet and it will take a conscious and informed effort to recognize and take advantage of the healthy options as they become available. The main characteristics of the educational programs in GHFN are, first of all, the use of the products available at the Northern Store, and second, focus on youth as the future change-makers. Nevertheless, programs targeted at adults are equally important since parents are a great influence on their children. As the ADI worker Lionel Flett mentioned: "We need help from home. They [children at school] bring junk food from home".

Overall, the impact of the educational programs on the health status of the community will be very limited unless the issues of high food prices, transportation, and low incomes are given priority. Children may attempt to stay 5 consecutive days without Coke, but will they have financial and mental support from their families who struggle with many issues of poverty, addictions and perhaps domestic violence, to keep up the healthy habit?

As for reinforcing cultural values (the importance of reviving historic traditions was emphasized earlier in the section that dealt with the Indigenous perceptions around food), the fishing plant is the enterprise that is continuing with a traditional occupation. Gardening also strengthens the natural bond with food from the land. Apart from these programs, no country food project was identified. Nevertheless, a number of people in the community, mostly from the older generation, maintain traditional lifestyles. A survey of 41 households conducted in July 2009 in Islam et al., (2011) revealed that 67% of households either hunted or fished, or received country food from relatives. Ensuring a more or less stable supply of country foods will require commercialization of traditional and country foods. This gives rise to some concerns such as deterioration of sharing networks, overhunting, and safety inspections barriers. However, this is an idea to explore more thoroughly, and it has already been successfully tested in Nunavut,[33] a territory which is confronted with many of the same challenges relating to food insecurity as Manitoba's North.

In order to have a lasting impact on food sustainability and affordability, a holistic approach will be required with different players enhancing and supporting each other's work. The new SE in GHFN is making a positive step towards providing healthy foods to the community by raising chickens, turkeys, and growing a wide range of fruit and vegetables. Community economic development as promoted by Meechim Inc. is not looking beyond the community for development, but rather seeks to produce to meet local needs, to hire locally, to purchase locally, to invest locally (Loxley et al., 2007), at the same time reigniting the practice of gardening for future generations to follow. Nevertheless, given the size of the community and the great demand for food which will still pose a great dependence on the Northern Store, the combination of both active development of the SEs and increasing people's purchasing powers in case of the imported foods may be required. The next section will bring together the information found about the food programs, the health, and the economic situation of the community to highlight the required sustained efforts from government, SE management, and community members to make the transition from healthy food projects to healthy living.

The Path to the Healthy Living

Our analysis of challenges and opportunities of promoting healthy living has given rise to a number of critical themes. What are some of the things we need to consider first in order to reduce diabetes and improve the overall well-being of community members in the future? What efforts and policy changes are needed in both the short and the long run? This section will show, with the use of examples, that the support should come from diverse institutions and groups. The discussion may be applied to many remote northern communities.

- **Social determinants of health; recognizing complexity:** The first fundamental idea lays in the fact that noticeable health improvements will not occur unless a complex holistic approach that includes a variety of programs and supports is applied.

> "By just introducing the changes to diet, it would take more than a generation to see a change in diabetes."
>
> *Dr. Sharon Bruce, Associate Professor, Community Health Sciences, University of Manitoba.*

It has been scientifically proven that weight loss associated with a low-calorie diet plays a critical role in slowing down development of T2D and, perhaps, even preventing it completely. However, dietary changes as a strategy to address diabetes in First Nation communities such as GHFN cannot be isolated from many social determinants of health like unemployment, housing and living conditions, barriers to health care access, early childhood development, racism and social exclusion — all of those aspects that form the conditions in which people are born, grow, live, work and age. In turn, adverse social conditions can create physiological and psychological stress. It is recognized that stress affects cardiovascular and immune systems, and if tension persists for the long-term, it makes people more vulnerable to infections, high blood pressure, diabetes, stroke, depression, and aggression (Marmot, 2003). Moreover, living in adverse conditions creates the feeling of shame, insecurity and worthlessness. As noted in Mikkonen and Raphael (2010) "Stressful living conditions make it extremely hard to take up physical leisure activity or practice healthy eating habits because most of one's energy is directed towards coping with day-to-day life. Therefore, taking drugs — either prescribed or illegal — relieves only the symptoms of stress. Similarly, healthy living programs aimed at underprivileged citizens are

not very efficient in terms of improving health and the quality of life." (p. 10).

> "There is an Ojibway term called mino-bimaadiziwin which means 'living in a good way', not trying to isolate it down to a factor. Physical, emotional, spiritual, mental healths are all important."
>
> *Jon McGavock, Research Scientist, Children's Hospital Research Institute of Manitoba.*

The end goal maybe to reduce diabetes, but the measures to achieving that goal will have to tackle many other social ills. The need for strategic actions on the social determinants of health was one of the important actions highlighted in "Diabetes in Manitoba A Call to Action" (2009).

- **Encouraging early intervention and prevention:** Early intervention is important to stop the exacerbation of adverse habits and health conditions. First of all, early detection of prediabetes and action on it will ensure the condition doesn't develop into T2D. This calls for a separate investigation into the efficiency of the nursing unit, their staffing and capacity problems and funding needs. Furthermore, research shows strong correlation between early childhood experiences and lifelong health outcomes. As mentioned in "Early Childhood Experiences And Health" (2008): "it is widely recognized that factors such as nutrition, housing quality, and household and community safety — all linked with family resources — are strongly linked with child health." (p. 2). Therefore, concentrating on children will also ensure that we are preventing many diseases from developing into conditions in their adulthood that will require costly medical treatment. Children have already been a focus of a number of programs and foundations (North West Company's Healthy Horizons Foundation, peer mentorship program at the school in GHFN).

- **Vision — finding balance between traditional and modern:** The conflict between traditional values and the realities of the market economy creates obstacles for moving forward as in the case of a country food market. SEs, however, can in some ways create economic opportunities for local residents *and* revive traditional livelihoods. For many years "export promotion based on foreign capital and relative neglect of the need of the Aboriginal community" (Loxley, 2010, p. 11) was the most common strategy suggested for the Canadian North. In contrast, SEs try to challenge this well-established model by replacing the export promotion strategy with the strategy of local production for local use. Especially nowadays when younger generations are less interested in living off the land than their ancestors, there is an acute need to find structurally different ways to provide food and other basic items for the community which may combine traditional and corporate aspects, however with the overall emphasis on living in a sustainable way (conserve and replenish). Consultations with the particular communities are necessary in order to understand how traditions can be better integrated with the task of alleviating poverty, and how the opinions of Elders can be better emphasized. There is already some recognition from the community members that the SEs will act as appropriate models for economic and social development. Loney (2016) notes that "Elders are recognizing social enterprises as a modern version of how things used to be done" (p.35).

- **Stimulating the sense of urgency and involvement within the community:** The sense of urgency to address many of the poverty-related issues in the remote northern communities is often lacking. Extreme poverty makes people lose hope. The associated loss of dignity and self-respect can prevent community members from taking action to deal with matters of importance. This can negatively affect the uptake of new initiatives that in theory are thought to bring positive change. Educating and involv-

ing community members is critical, especially in large communities like GHFN. Are community members informed of the new opportunities? Have the benefits of the new interventions been made clear? Do community members believe that outsiders decide for them how to build the community instead of them being allowed to take the lead? Answers to those and similar questions can explain why the community is not actively responding to new initiatives.

- **Education:** In the food area, sustaining balance between education and healthy food options is pivotal because it will ensure that people are presented with alternatives and the resources spent on the educational programs are not wasted. In this way, educating children at school about the harms of soda drinks may not be effective, while the school-to-farm project which connects education about healthy eating to the farm where the children can grow their own food can produce better results.

- **Improving government programs and policies:** No significant change is possible without revisions in the current policies and programs. Loney (2016) calls it "making it easy for problem solvers" (p. 35). SE directors in GHFN have highlighted some policy barriers that should be removed in order to help promote the work of SEs and ensure more thoughtful government resource allocation.

1) **Diabetes Diet Supplement.** The Diabetes Diet Supplement is the addition to the monthly basic assistance that is intended to help diabetic patients purchase the food items required. As was estimated earlier, based on the standard 1,800 calorie diet and 484 diabetic patients in GHFN, the total amount of assistance could reach $392,000 per year. There are a couple of concerns about this allotment as it relates to the northern community. First of all, while the diabetic patients are supported financially to maintain special diets, people who are at the increased risk of developing T2D are not given the same opportunity, hence prevention measures are ignored. Second, the amount of assistance is not indexed to the higher prices in the North. And third, the extra money is spent in the Northern Store which means the policy supports the current model of importing food from the South. The solution to the last concern can be working with the local SE to link the supplement to the healthy food options produced locally, for example though vouchers for Meechim's healthy products.

2) **The Canada Revenue Agency (CRA) New Qualified Donee Regime.** In January 2014 CRA created a list of eligible donees, including municipal or public bodies that can issue official donation receipts and are eligible to receive gifts from registered charities. Before this policy change, funders supporting projects in communities could transfer grants directly to communities. However, at present some communities are not included in the list of eligible donees, and the money transfer becomes problematic. Communities that want to be recognized as qualified donees must apply for registration and once registered must ensure that they accurately issue donation receipts, correctly valuate non-cash gifts, maintain proper books and records, and provide CRA with access when requested (Milley, 2013). Thus, Tides Canada, which administers the NMFCCC, was not able to transfer their grant to GHFN directly. Transferring the grant money through the University of Manitoba has resulted in the loss of money due to the University charging an administration fee of 15%. Therefore, the change has affected the sovereignty of communities to receive funds.

3)NNC **Subsidy.** It was shown in an earlier section that the cost of the RNFB remains high despite the introduction of the NNC subsidy. The report by Enrg Research Group observes: "The NNC program is lowering prices on NNC eligible products. In this respect, the program is working. However, costs remain high. Is lowering prices enough for local residents who are managing their households on limited and fixed budgets? We believe the answer is "No." That said, NNC is part of the solution, *but not the entire solution*." [Italics added] (Enrg Research Group, 2014). At present the subsidy is applied to the freight costs of the imported food items. SE directors argue that while the imported foods are supported, the local food production is not (Loney, 2016). It would be helpful to see the subsidy going to the farm, into the labour of growing local food as the costs of operating the small-scale local food SE in the North are high (e.g. overhead costs are relatively high, wages should be socially acceptable, workers need training).

At this point it is unclear whether the new SEs in GH will have enough capacity to provide healthy food for the whole community over the long-term. If this is not attainable, other means of food supply have to be substantially improved. Benefits can come from infrastructure improvements like building an all-weather road, that might eventually lower the price of imported food (for more information see Manitoba East Side Road Authority, 2010).

- **Stable long-term financial support and government subsidies:** The case for government subsidy is not new. In the Thompson et al., (2014) study of the Wabung Fisheries Coop, authors conclude that in order "to improve sustainable livelihoods, government investment is needed to improve infrastructure in First Nation and northern communities (e.g., roads, safe water systems, housing, and public transit)." (p. 188). Loxley (2010) is also arguing for government subsidization. He explains that in the reality of the market economy, the 'needs' of the community are equated with 'demands'. In this situation low purchasing power means a low level of effective demand, therefore many 'basic' needs will not be met through the marketplace. Rectifying systemic failures of this sort will require subsidization of services to communities. Loxley (2010) further concludes that subsidization of services is a "crucial element in successful CD activities designed to meet community needs" (p. 28). Moreover, Enrg Research Group (2014) recommends an increase in government funding be allocated to the NNC subsidy. Due to population increases in the North and country foods having "sustainability and acceptance challenges", the report predicts a rise in demand for the NNC subsidy. The authors advise that the NNC should be indexed to inflation or to changes in major cost drivers of retail prices in the North.

SEs are faced with many challenges (e.g. competing with monopolies such as North West Company in terms of prices, product range and additional services; transforming the tastes and habits of the local residents in case of buying healthier foods, facing high operating cost of running a small-scale business), and while some of the matters are in their control (e.g. hire a more responsible manager, improve their business strategy, increase community involvement), others are difficult to address with existing resources. Often significant amounts of time are required for the new initiative to be accepted by the members of the northern community. A long history of government projects and outside interventions that were not well-considered may be responsible for a slow uptake of the new initiatives. It is also known that the federal government has a tendency of walking away from funding programs that communities have come to rely on ("Who's Accountable to the Commu-

nity?", 2012). That's why there exists a cautious view of anything imposed from outside.

While there are no oversimplified solutions to the issue of food insecurity, the SE model is a step in the right direction provided it encompasses all the necessary requirements: active community involvement and education, co-operation with volunteer and research groups, strong First Nation leadership support, preparedness to wait for the positive outcomes. Even though a self-sustaining business is the goal, SE will find it extremely difficult to prosper without subsidization, especially at the initial stages of operation.

- **Considerations for SEs:** It becomes important to present a clear economic and social case for subsidization of SEs to sympathetic governments, funding agencies, or foundations (Loxley, 2010, p. 251). Moreover, demonstrating strong and committed leadership in the community will ensure that people are supported without creating dependency, and that the investments are going to empower people, which is particularly important for funders.

New SEs can explore different funding options. Some programs to consider are:

1) The Communities Economic Development Fund (CEDF) provides loans for commercial fishing to purchase repair of equipment used in a viable fishing operation.[34] CEDF can also provide guidance and support to complete a business plan.

2) INAC's National Child Benefit Reinvestment (NCBR) program designed to support innovative community-based projects with the focus on five activity areas on-reserve: childcare; child nutrition; support for parents; home-to-work transition; and cultural enrichment (INAC, n.d.).

Conclusion

Colonial practices have seriously disrupted Indigenous traditional economies, governments, and social relations. The associated significant socio-cultural changes within Indigenous communities such as GHFN have led to drastic lifestyle transformations. The increase in permanent settlements (reserves), the introduction of the market economy and the import of food from the south resulted in the decreased reliance on country foods for subsistence and in a more sedentary life style. As a consequence, food-related health problems have become common. Obesity and many chronic conditions — diabetes, heart disease, high blood pressure — are increasingly prevalent in GHFN. Moreover, racism and the loss of family ties through residential schools have created a lot of trauma for Indigenous people that prevents them from effectively coping with many of the aforementioned diseases.

Inaction on poverty and food insecurity problem in GHFN is costly. In this study it was estimated that $2.6 million in government expenditures goes to treating diabetes in the community annually. And the lack of employment opportunities is responsible for annual government spending of $13.6 million in social assistance.

However, unhealthy food consumption is hardly a matter of personal choice for community members as the cost of food is extremely high, especially for people who live on social assistance. According to the survey conducted as part of this research, it was found that the average share of household's income spent on food is around 30%. Furthermore, the survey revealed that even the highest observable spending on food ($259 per month for one person) is 35% below the required level of spending needed in order to maintain the healthy diet as calculated by the RNHB.

In these conditions, Meechim Inc. has taken a positive stance to eradicate food insecurity by re-building the local economy. The new SE is confronted with many challenges — the slow pace of community involvement, difficulties in accessing funding and unfavorable social and geographical conditions. Nevertheless, it was shown that while improvements are needed, it has the potential not only to help make food more affordable but also to bring people together and instill the "we-can-do-it" approach to dealing with issues in the community. It is worth remembering, however, that the new initiative will only achieve meaningful results if intensive input from the community is encouraged and sustained.

Government also has a role to play to keep the momentum of the local food production going through improvement of policies, in project funding and in increasing subsidy amounts.

Likewise, the critical themes as they pertain to the improvement to the overall health status and well-being of community members were discussed, mainly focusing on social determinants of health, education, government policies, long-term subsidizing and inefficient funding allocation. Treating and addressing the pandemic of diabetes within Indigenous populations will require a holistic approach because access to healthy food, although extremely important, cannot solely guarantee success in eliminating many serious health problems such as diabetes.

The paper highlighted the major problems in the GHFN related to economy and health by backing up the discussion with the most recent statistics and concrete examples evoked by the community members. It is the author's hope that the study will assist the community and the SE in promoting their initiative and in better understanding the connection between health, food and education. Moreover, it may also be useful for the SE to think through its strategy and the outcomes they want to achieve both in the immediate future and in the long-term.

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Appendices

Appendix A.
List of businesses in Operation.

On Stevenson Island.

- **The Northern Store**
  36 employees of which 32 (89%) are First Nation.
- **Ministik**
  4–5 full-time staff plus owner. Less than 50% groceries. Large selection of GM and hardware merchandise.
- **Mikiskew**
  9–10 full-time staff and 3–4 casual. Good selection of grocery products, although limited selection of fresh produce. Significant amount of frozen meats.
- Source: Northern Food Retail Data Collection & Analysis by Enrg Research Group

On Reserve

- **The Convenience Store**
  Two full time including owner plus some casual employees. Very limited grocery options. Prices are high. Occasionally provides gasoline for sale.
- **New Store**
  Construction started in September 2015. Currently operating. Independently owned business. Food products choice similar to that of the Northern Store.
- **Meechim Farm and Market**
  10 employees.
- **Danny's Store.**
  The biggest store on the reserve.
- **Ma&Pa Stores.**
  No information on the number.
- **Pharmacy.**
  Located in the Nursing Station, jointly started by MKO and the Northwest Company. Opened in August 2015.
- **Taxi boats.**
  Independently owned. 5 dollars to go across the lake to the Northern Store.
- **Wabung Fisheries Co-op**
  (Fish Plant)

Appendix B.
Household Survey Questions.

1) General

a) How many people live with you in one household, including yourself?

b) How many of them are children younger than 18 years old?

c) Are you currently…?
   1. Student
   2. Employed for wages
   3. Self-employed
   4. Out of work and looking for work
   5. Out of work but not currently looking for work
   6. Retired
   7. Other — please specify

d) What is your total household's *monthly* income?
   1. Less than $500
   2. $500–$999
   3. $1,000–$1,499
   4. $1,500 to $1,999
   5. $2,000 to $2,499
   6. $2,500 to $2,999
   7. $3,000 to $3,499
   8. $3,500 to $3,999
   9. $4,000 to $4,499
   10. $4,500 to $4,999
   11. $5,000 to $5,999
   12. More than $6000
   13. Other — please specify the amount of your income

e) What is the source of the income? Please *check all* that apply.
   1. Wage
   2. Employment and Income Assistance
   3. Child benefits
   4. Retirement pension
   5. Other — please specify

2. Spending on food and utilities

a) How often do you buy food for your household from the local stores?
   1. More often than 2 times a week
   2. Twice a week
   3. Once a week
   4. Once in 2 weeks
   5. Depending on when money is available (right after paydays, welfare days, etc.)
   6. Other — please specify

b) How much money do you spend on food *per trip*?
   1. Less than $20
   2. $20–$29
   3. $30–$39
   4. $40–$49
   5. $50–$59
   6. $60–$69
   7. $70–$79
   8. $80–$89
   9. $90–$99
   10. $100–$119
   11. $120–$139
   12. More than $140
   13. Other — please specify

c) How much of it is spent on transportation like boat taxi or gas? Please indicate the amount.

d) How much do you spend on heating and electricity *per month*?
   1. Less than $50
   2. $50–$100
   3. $100–$150
   4. $150–$200
   5. $250–$300
   6. More than $300
   7. Other — please specify

Health

a) How many members of your household are diagnosed with diabetes?

b) How many members of your household are diagnosed with any other chronic disease (cardiovascular, autoimmune, renal diseases)?

Endnotes

1 For example, see "The Great Northern Plan" (1981) by J. Loxley. The plan had a complete section on agriculture.

2 GHFN is a fly-in community that is not accessible by all-weather road.

3 "Food insecurity exists within a household when one or more members do not have access to the variety or quantity of food that they need due to lack of money." (Roshanafshar & Hawkins, 2015).

4 Tea made from a composition of herbs collected in the bush.

5 In 2010 the mandatory long form census was replaced by the voluntary National Household Survey (NHS) whose results are extensively used here as the most recent data on GHFN. It should be mentioned that due to the change from a mandatory to a voluntary survey, part of the differences between the 2006 and 2011 data might be attributable to the non-response bias, although the extent of this bias is impossible to determine with certainty. Global non-response rate for GHFN was 26.8%. In previous research dealing with the NHS 2011 data concerns were raised about the quality and reliability of this data, especially in case of smaller communities (Lezubski, Silver, 2015).

6 Source: 2006 Census Population and Dwelling Count Amendments.

7 If we apply the earnings as percentage of income rate (56%) to the total income in the community $17,427,165, we arrive at the slightly different figure — $9,759,212.

8 Average incomes are based on actual dollar amounts.

9 Clark (2017) notes that the Federal Income Assistance rates are supposed to be based upon provincial rates, but they have not kept pace. Particularly, there is inadequate funding for special needs under Income Assistance.

10 Many Indigenous families on reserve do not receive this benefit because they are not filing their income taxes or are unaware of the program (McKie, 2017).

11 NECB is an increase of $25 to the monthly basic benefits of EIA households. The NECB is intended to assist the households with the increase in the cost of basic necessities resulting from rising energy costs, such as the increased cost of transporting goods to northern communities (EIA Administrative Manual, n.d.).

12 The CDB provides up to $2,730 per year ($227.50 per month) for each child eligible for the DTC.

13 We are acknowledging that not all of the salaries may go the local residents. Some people are employed from outside the reserve. However, this percentage is not known.

14 Includes only basic income assistance: no additional disability benefits are accounted for.

15 The minimum average annual income for person above 18 years old in the household in the sample is $2,999 which is an extremely low value. This might be due to misinterpretation of the question (e.g. the respondent reporting only his/her income and not the income of the household as a whole which resulted in a low value after the division by the number of members in a household). However, due to true reason behind the reported number not being identified, the observation is not omitted.

16 The cost is "approximately 30% higher than shipping freight a comparable distance in the South" (Enrg Research Group, 2014).

17 For the average price of the RNFB per person per month, we have assumed 4 weeks in a month. In addition, the differences between the diet of an adult and that of a child are not taken into account.

18 To compare to the average calorie intake for various gender and age groups at three different levels of physical activity, see https://www.cnpp.usda.gov/sites/default/files/usda_food_patterns/EstimatedCalorieNeedsPerDayTable.pdf

19 Obesity rates are higher in Indigenous groups than non-Indigenous groups: 74% of adults and 43% of children and youth are overweight or obese (Canadian Diabetes Association, 2015, p. 10)

20 The total number of adult/pediatric care patients in the table doesn't not reflect the actual total number of people on register at the Nursing station. For example, the same person can be on file for two or more illnesses simultaneously (e.g. both diabetes and renal disease; diabetes, cardiovascular and renal and so forth).

21 Registered male and females on own reserve, June 2016. Source: http://fnp-ppn.aandc-aadnc.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=297&lang=eng

22 "The Non-Insured Health Benefits (NIHB) Program is a national program that provides coverage to registered First Nations and recognized Inuit for a limited range of medically necessary items and services that are not covered by other plans and programs." (The Non-Insured Health Benefits (NIHB), n.d.)

23 Hemodialysis is the procedure to filter one's blood in order to remove wastes, extra salts and fluids.

24 According to a Dialysis Unit worker there were cases of patients on dialysis who were homeless (shared with researcher over the phone)

25 To put this number in the context of the total Health Canada transfers: $3,938,186 was transferred to GHFN by Health Canada in 2014 and $4,157,441 in 2015 (Garden Hill First Nation Independent Auditors' Report Consolidated Financial Statements, 2015).

26 236 houses in GHFN have no water service. Source: Four Arrows Regional Health Authority http://www.fourarrowsrha.ca/profiles/

27 'Meechim' is the word for 'food' in Oji-Cree.

28 Currently the farm occupies 30–40% of the allocated land.

29 There were approximately 1000 chickens in 2016 — half of them were layers, another half of them were meat birds.

30 "Tomorrow" in Ojibway-Cree language.

31 This peer mentorship program is designed in collaboration with the research team from the Manitoba Institute of Child Health. Children play low organized games in the gymnasium such as basketball for 45 minutes, then eat the healthy snack and talk to older kids. The purpose of the program is to promote active living and engage into some knowledge sharing and teaching. The after school intervention lasts 90 minutes and takes place 2 days a week. The goal is to build the capacity for the community to run their own program. The health outcomes of this intervention were assessed and it was found that the program had improved the weight and healthy living knowledge in children (Eskicioglu et al., 2014).

32 The total number of census families in private households is 640 (2011 Census data)

33 The government of Nunavut has a Country Food Distribution Program which assists hunters' and trappers' organisations and municipalities with the costs of operating country food infrastructure (e.g. markets, community freezers) (Country Food Distribution Program, n.d.). For a few years, the program has been supporting the Iqaluit country food market which is part of Iqaluit-based social enterprise Project Nunavut. Although having to deal with irregular supply, locals were quickly buying whatever was available at the market, making this project a huge success. This confirmed that many families were ready to buy traditional country foods to supplement their diets despite the common concern for the "betrayal of sacred Inuit traditions" (Weber, 2014). Some community members think that "it's not the Inuit way of life to sell to others" (ibid.). However, the reality is that the market feeds the families and, once commercialized, hunting and gathering brings enough income to hunters to maintain the traditional lifestyle. The estimated cost of one hunting trip in Nunavut is between $15,000 and $23,400 (ibid.). Full government subsidization of the hunters' costs is the only way to ensure that both sharing and hunting traditions are preserved (Kim, 2016). Until this is introduced, it is impossible to consistently supply country foods and keep the sharing tradition alive when costly hunting technology is involved.

34 See more at http://www.cedf.mb.ca/fisheries-program/

Unit 205 – 765 Main St., Winnipeg, MB R2W 3N5
TEL 204-927-3200 FAX 204-927-3201
EMAIL ccpamb@policyalternatives.ca
WEBSITE www.policyalternatives.ca