

Final Research Proposal

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## Overview

### Research Statement

In my thesis, I am hoping to examine the current state of housing in Indigenous communities in Canada and discuss any problems that might be prevalent (ie. the prevalence of overcrowding and the potential health risks it could cause, reasons why the historical implementation of colonial style homes clashed with the indigenous lifestyle and environmental conditions, etc.). From there I want to examine current usage of sustainable building practices on reserve and the economic costs, environmental benefits, and impact on citizen well-being these technologies could have if they were to be implemented in more indigenous communities. The housing crisis on reserves continues to be a major problem with no clear solution, I believe this needs to be addressed using more creative ideas to help increase the well-being of our Indigenous peoples. The state of one's housing situation can greatly increase one's life outside the home (overcrowding leading to more tension or fighting, mold leading to health issues etc). I think that if people want to address some of the complex problems people on reserve face, it makes the most sense to start with making sure they have a solid home. As can be seen above, this is a complex problem that branches out into different disciplines. In order to create a good picture of reserve homes, it seems necessary to discuss not only statistics and building techniques, but the histories and policies that lead to them and the effects it has had on individual's well beings. Home isn't one thing, it is something people have emotional or even spiritual connections to and it is important that is addressed.

To summarize, I want to research how sustainable building practices can be used to address the housing crisis on reserves.

### Objectives

- Provide general context for colonial creation of reserves
- Identify prevalent problems with reserve system housing (and if space allows, Inuit communities)
- Explain Waziyatawin's perspective on addressing reserve problems. (That it is impossible to "go back" to the traditional lifestyle and how using these

improvements on ancient technologies can help regain those traditional ideologies and become proper stewards of our homelands.)

- Identify and explain several popular green alternatives (i.e. cob building materials, natural insulation, earth ship design structure, sustainable energies, efficient biomass stoves, and sustainable water collection/usage)
- Evaluate appropriateness of technologies economic costs, environmental benefits, and impact on citizen well-being these green alternatives could have if they were to be implemented on more reserves.
- Create policy recommendations

### Rationale for Interdisciplinary Approach

I believe the housing crisis on reserves need to be addressed using more creative ideas to help increase the well-being of our Indigenous peoples. The state of one's housing situation can greatly increase one's life outside the home (overcrowding leading to more tension or fighting, mold leading to health issues etc). I think that if people want to address some of the complex problems people on reserve face, it makes the most sense to start with making sure they have a solid home. It is evidentially a complex problem that branches out into different disciplines. In order to create a good picture of reserve homes, it seems necessary to discuss not only statistics and building techniques, but the histories and policies that lead to them and the effects it has had on individual's well beings. Home isn't one thing, it is something people have emotional or even spiritual connections to and it is important that is addressed.

### Identification of Relevant Disciplines

1. First Nations Studies (especially policy history)
2. Environmental Studies
3. Economics

It is to be noted that these three disciplines are quite broad, however the many subdisciplines intertwine in this work in a way that is difficult to single out.

### Project Outline

1. Introduction
  - a. Methods

- b. Significance of topic
2. Brief history of Reserve homes
  - a. Policies
  - b. Implementation
3. Prevalent problems today
  - a. Supply problems
  - b. Structural problems
  - c. Health/Social problems
  - d. Spiritual/Cultural problems
4. Explain Waziyatawin's perspective on addressing reserve problems
5. List & Explain some popular green building practices
  - a. Home structure and material
    - i. Cob
    - ii. Earthbag & rammed earth
    - iii. Earth Ship principles
  - b. Insulation
    - i. Straw bale
  - c. Energy
    - i. Sustainable energies
    - ii. Biomass stoves
  - d. Other aspects of a sustainable lifestyle
    - i. Water
    - ii. Gardens/Compost
6. Evaluate appropriateness of technologies
  - a. economic costs
  - b. environmental benefits,
  - c. impact on citizen well-being
7. Case for embracing "greener" homes in rural indigenous communities
8. Policy Recommendations
9. Conclusion

### Working Reference List

Note – Some of these sources have not yet been read in their entirety

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## Literature Review

### Reserve Context & Problems

The Literature shows that much of the housing on First Nations reservations is in poor condition. The houses for the reserves were originally made quickly and cheaply with the western nuclear-style-family in mind. Not much has changed today; houses are still often poorly made and not suitable for multi-generation families. The bands are responsible for organizing and managing the houses with support from the federal government (Government of Canada, 2014). Indian Affairs divides this money between regional offices, district offices, and the District Indian Councils, Tribal Councils and Bands (Kydd, 1992). The amount of money given to the different offices and bands depends on factors such as population, cost of construction, need, past spending performance, and how successful they are with negotiating with officials (Kydd, 1992). The government encourages bands to find other sources of money to supplement the government funding (Government of Canada, 2014). Between 2006-2007 and 2013-2014 the Canadian government invested more than 2.3 million dollars in support of on-reserve housing (Government of Canada, 2014). Between the years of 2006-2007 and 2013-2014, the funding from the Canadian Government helped in the building of 11 364 new units and renovating of 21 212 units, along with other housing projects (Government of Canada, 2014).

First Nations self-reported 107 627 housing units in March of 2013 (Assembly of First Nations, 2013). To get an idea of the current state of the housing crisis between 2010 and 2031 it is estimated there will be a need for 130 197 new units, 11 855 replacement units, and a little under 10 000 major repairs. It is no surprise that there are



many challenges when it comes to reserve homes. Not only is there a trend of overcrowding, insufficient infrastructure and amenities, and difficulties accessing funding across the country, but there is also a lack of accurate numerical data to properly address the issue (Assembly of First Nations, 2013). One issue that has been talked about lately is the mold growth in on-reserve homes.

Although it has been agreed upon that mold growth in Canada is a problem, there is no comprehensive data to show to what extent (Optis, Shaw, Stephenson, & Wild, 2012). Some research has been done however, to explain why reserve homes are susceptible to mold growth. Reasons include high levels of moisture caused by structural damage, overcrowded homes, and insufficient use of ventilation systems. With loss of territory during colonization came loss of traditional homes being built and the importation of inappropriate building materials being used. Homes were built for the indigenous people with little consideration for the environment or lifestyle of the occupants. In fact, because of this it is common for people on reserve to block off ventilation systems that would prevent mold in order to prevent heat loss (Optis et al., 2012).

Overcrowding is another major issue. The Assembly of First Nations (2013) states 23.4% of First Nation adults lived in overcrowded homes. This is detrimental as overcrowding leads to a reduced lifespan of a home. Additionally, it increases family tension and violence (Assembly of First Nations, 2013). It also leads to many health problems including the high rate of tuberculosis (Optis et al., 2012).

Housing shortages are a major problem as described earlier and lead to an increase in overcrowding. 94.1% of First Nations have waiting lists for housing (Assembly of First Nations, 2013). The housing crisis was made even worse after Bill C-31 passed and many women were able to return to their communities, yet no additional funding was available because of it (Optis et al., 2012).

The isolation of many reserves also cause many problems. Not only does lack of jobs mean a decreased likelihood of personal funding going into home building and improvements, it also means an increase in labour and material costs to work on a home (Assembly of First Nations, 2013). One source notes that in Ontario building a

house in the north cost an estimated 30% more compared to in the south (Assembly of First Nations, 2013).

Many other problems exist including water, electricity, heating and the like. In fact it was found that 34% of communities get water by collecting it (rivers, lakes, etc), by truck, or from wells (Assembly of First Nations, 2013). In addition, 31% of homes have unsatisfactory heating systems (Assembly of First Nations, 2013). With insufficient heat and unsafe water prevalent in the communities it gives yet another reason to the high levels of health problems on reserve.

### Natural Building

Natural building emphasises “using simple, easy-to-learn techniques using locally available, renewable resources (Kennedy et al., 2015). It is making the decision to turn away from the easy and cheap, and instead be creative in designing a home that is better for our world. Not only is sustainable building good for the environment, it is empowering. When people are able to build a lot of their home themselves, not only is it possible to build a home for tens of thousands of dollars, but it becomes something they can really feel proud of (Kennedy et al., 2015). Natural building can also help people feel more connected to the land and in tune with their environment (Waziyatawin, 2016).

The major issue with most sustainable building practices is getting it to comply with building codes. Building codes are concerned about the hazard inside the building and pay no regard to how hazardous the building may be to the environment (Kennedy et al., 2015). Code officials are hesitant to accept many natural and sustainable building practices as they are uncommon and may not have been tested thoroughly enough to be proven safe. However, progress is being made. In 2015, the International Residential Code (which is the most widely used code in the USA) approved appendices for light straw-clay construction and straw bale construction. As organizations for environmentally friendly building become prominent, more natural building approaches are becoming more widely accepted (Kennedy et al., 2015). In Canada, each province and territory has their own building code which is based on a national building code. However some cities, like Vancouver, do not abide by the provincial code but rather falls under a city bylaw (Province of British Columbia, 2017).

Cob buildings, which are made of mud with no wooden frameworks or bricks, is beginning to regain popularity in North America and Europe. There two popular types of cob, English cob and Oregon cob. English cob is a mixture of sandy clay subsoil with water, straw, and sometimes finely crushed shale. Tractor or excavators mix the cob and load the cob onto the wall. The cob is then stomped on by foot and beaten into shape with a wooden paddle (Kennedy et al., 2015).

Oregon cob uses stiffer cob loaves which are worked into the existing cob. Oregon cob has a higher proportion of coarse sand and strong straw which helps strengthen it. It is generally mixed by stomping on it over a tarp. Because of the flexibility of cob it is very simple to create built in shelves, nooks, arches, and many other creative designs. Cob is frequently combined with other natural materials, especially straw bales. It is very appealing as it can be made very cheaply with minimal tools and limited training (Kennedy et al., 2015).

Although cob may not sound like a sturdy structure, when designed for the climate cob can withstand almost any natural force. Cob moderate's humidity, discourages mold growth, are more or less fireproof, and are great at muffling sound. There are ways to test if your local soil is suitable for cob. Additionally, it is recommended to try building smaller cob structures like sheds, outhouses, benches or statues in order to find a good mix and develop better technique (Snell & Callahan, 2005).

Another building material is earthbag construction. Earthbags are polypropylene or burlap bags filled with soil, sand, gravel, or clay. The bags are filled with the damp substance, stacked in place, adjusted and tamped, and often secured with barbed wire. These bags are then covered with plaster. Although cement and lime plasters are most common, earthen plasters are often used as well. Earthbag homes can be made in a dome shape but all sorts of designs are possible. Wojciechowska's book, *Building with Earth*, explains many different building techniques as well as waterproofing methods and types of finishes (2001).

There are a variety of great insulations that can be used in sustainable building. One great material is straw bales. Straw is generally sold in large bales that can be

used as a form of building block. Straw building began in the late 1800s, and some of these structures are still standing today. Straw is an abundant waste product of farming that is renewable and cheap. Additionally, it has highly insulating properties that can compare to, and often outperform, traditional insulation. Strawbale is able to outperform because it allows for a very thick walls at a cheaper price. (Magwood & Mack, 2000).

When buying straw bales, it is important to examine the tightness, dryness, seed content and size. As of the year 2000, straw costed between one and four Canadian dollars a bale. Although straw bale walls are generally covered with stucco, natural plaster like clay and cob can also be used. Straw bale is ideal in almost all environments. Like the other natural materials, straw bale walls have huge flexibility in design and can be adapted to better meet the need of the climate and the occupants (Magwood & Mack, 2000).

Similar to straw bale is hempcrete construction. Since the hemp cultivation ban in Canada was lifted in 1998, building with hemp is gaining popularity. Hempcrete, also known as hemp-lime, mixes hemp hurds with a mineral binder (generally lime) and water. When the binder is set, cured, and dried, the hemp particles are adhered to one another. The resulting hempcrete has thermal, structural, and moisture-controlling properties that make it a desirable insulation. Additionally, hempcrete is easy to shape and mold making it easy to work with in more creative ways (Magwood, 2016).

Like walls and insulation, there are many different materials for building roofs. Many natural houses build roofs out of the same material as the house; however, there are many other roof options such as green roofs. Green roofs are often made with sod, turf or straw. These living roofs can help buffer the heat from the sun, act as light insulation in the winter, provide a surface to grow plants, and provide an aesthetically pleasing look. These roofs are built on a low pitch roof frame, filled in with a solid roof deck, covered in some form of waterproof material (membrane), and then covered in the organic material. A drainage mat or volcanic rock between the membrane and soil is encouraged to help water drainage. It is important green roofs are built on sturdy homes that can support all the extra weight (Kennedy et al., 2015).

One method of heating is the the rocket mass heater. Rocket mass heaters are slow release radiant heaters that use dried firewood as fuel. The system uses a narrow, well insulated chamber to maintain a clean, hot fire. Because the fire burns sideways at very hot temperatures, the design actually burns the smoke leaving almost pure steam and a little mineral ash. What makes it unique is that they provide quick radiant heat and steady stored heat. The system is easy to lay out and install, it can be designed and built using “local, earth-based recycled, and reclaimed resources” (Wisner & Wisner, 2016, p.2). A lot of the structure can be built using cob and an old metal barrel. The major appeal of rocket mass heaters is that it can offer a great heat source while living off-grid. (Wisner & Wisner, 2016).

There are several methods for generating renewable energy. One method of conducting energy is wind turbines. An average family living in a 3-4 bedroom house uses around 5 000kWh to 6 000kWh of energy if the lighting is low energy and the appliances are new. Using this estimate can help determine the right kind of wind turbine for different homes. A wind turbine for domestic use costs between 8 000 and 80 000 Canadian dollars. In Pullen’s book (2011), he compares several wind turbines including the 11 000 dollar Kestrel E300 which produces around 2 200 kWh annually and the 40 000 dollar Evance Iskra 9000 which produces around 9 000 kWh of energy annually. However these estimates are based on ideal locations. Wind turbines are not a good choice in urban locations. For them to be worth while, turbines should be placed in an area with an average wind speed of at least 6 meters per second. For optimum wind speed it has been found the height of the house times ten is how far away the turbine should be positioned. Optimally the wind turbine is twice the height of the house to catch the best wind (Pullen, 2011).

Another method of obtaining renewable energy is through photovoltaic cells, also known as solar panels. Solar panels work by allowing light to pass through silicon crystal. Like wind turbines, the effectiveness of solar panels greatly depends on location. Solar panels need air circulation to keep them cool, because of that they are often located on rooftops. In fact, it is now possible to buy solar panels that look like roof slates. Although still relatively expensive, as solar panels increase in popularity they are

continuing to improve in quality and decrease in price to keep up with the growing market (Pullen, 2011).

Similar to photovoltaic cells is photovolatic-thermal. This system combines photovolatics with a thermal collector to provide electricity and hot water. This system is better able to cool to an ideal temperature than traditional solar pannels by using a fluid cooling system. However, lots of hot water is generated in the summer and little in the winter. Those considering this system should look into the two ways of storing the heat: phase change materials and geothermal storage (Pullen, 2011).

Depending on location, the best system of heating may not be from these new technologies but rather the design of the house itself. An example of this would be the architectural design called Earthships. Among other features, earthships are built into the earth with large angled windows facing south. This maximizes natural light and solar-gain during the winter months, with windows on sun-facing walls admitting light and heat. The thick and dense walls, generally built with earth filled tires, provide thermal mass that naturally regulates the interior temperature. With the right angles and measurement, this design should be able to heat the house in the winter and cool it in the summer (Snell & Callahan, 2005).

### Current Policy Ideas

These technologies could be very beneficial in northern, rural communities. There are 80 isolated communities in Northern Canada that are not “connected to the North American electricity or natural gas power grids” (Quinn, 2015). Most of these communities rely on imported diesel and face extremely high energy costs. In 2015, a senate report listed five recommendations to address these power issues, namely providing incentives for energy efficient homes, supporting renewable energy projects, and upgrading diesel facilities (Quinn, 2015). However, as clean power may be hard to come by in the dark winters, and shipping costs of fuels is extremely expensive, training locals in more forested communities how to create more efficient heating systems can reduce the strain on expensive power options and reduce the environmental impact of shipping costs and diesel emissions). Biomass options such as pellet stoves are being considered, however if the government where to invest in testing some of these

alternative biomass options, it could greatly improve lives with an assumed reduction in cost to alternatives.

In the year 2000, “an estimated 36.8% ... of housing units on the Navajo Nation lacked electricity” (Bain et al., 2004, p. 67). The cost of adding power lines to the community is very high because of the low population density. As unemployment rate in this area is around 50 percent, it is out of the budget to connect to the power grid. To provide power to the 18 000 homes that lack electricity would cost between \$115 000 000 and \$350 000 000 to install (Bain et al., 2004).

An article examines the possibility of installing self-contained solar systems in these 18 000 homes. If done by members of the nation it could provide much needed employment and economic development. When the article was printed in 2004, the Navajo Nation was developing an energy policy that included solar along with other fuel sources. If funding was secured for the project, it would be a great step in improving the quality of life and self-sufficiency for the Navajo Nation (Bain et al., 2014).

## Annotated Bibliography

Alcantara, C. (2007). Reduce transaction costs? Yes. Strengthen property rights?

Maybe: The First Nations Land Management Act and economic development on Canadian Indian reserves. *Public Choice* 132, 421-432.

The structure of property rights on Canadian reserves has been noted as a factor hindering economic development. This article examines two First Nations communities that have developed their own land code (after being granted the option to do so in the 1999 First Nations Land Management Act) and how it impacted development on reserve. The article summarizes the issues of property rights and its historical effects on economic development. The two communities later examined are Mississaugas of Scugog Island First Nation and Muskoday First Nation. The paper argued that land codes reduced the transaction costs by eliminating government involvement and allows lands to be managed in accordance to the needs and knowledge of the local people. However, while land codes allow bands to strengthen its individual property rights, it is up to the band to develop their land code in a way that does. Therefore it is not

guaranteed to aid in economic development. The article does not do any original research, rather it examines the problems with rights under the Indian Act, compares it to Native American land rights, and does an in depth analysis and comparison of two land codes that have been put in place. As I own a copy of the Lower Nicola Indian Band's land code it was interesting to compare it with the legislation outlined in the article. I was looking at this study earlier in the semester because it acknowledged the previous issues with creating new businesses on reserve all the bureaucratic red tape and extremely long waits for business proposal approvals. This drove the examination of systems being put into place to change that and encourage economic growth. However since I have steered my focus further away from the economic development topic I find this resource useful in looking at land codes to examine a bands legal framework around property and housing rights which would affect the both the need and the ability to implement sustainable technologies.

Barnsley, P. (2004). Housing problem worse than estimated. *Windspeaker*, 21(11), 57-60.

This article's focus is on a study done by officials in the Assembly of First Nations in the Quebec region that showed housing shortages were worse than stated by Shelia Fraser's April 2003 report and the national chief's Getting Results Strategy. The article discusses the 8,500 house shortfall, budget proposals, and different chiefs' perspectives on the housing crisis. The study found more than half of the homes on reserve need something renovated and that on-reserve homes are twice as crowded as the national average. Chief Wilfred King suggested that the money budgeted to housing would only be able to fix up "inferior" housing (his reserve has a huge mold problem) rather than fixing the problem by creating better quality homes. Although the information in this article is outdated it is useful to compare to budget proposals today. It includes different opinions on how to address the issues that helps shed light on the ideas presented at different levels. The data was an analysis of the Assembly of First Nation's study, quotes taken from political discussions, and interviews done with the Gulf Bay First Nation's chief Wilfred King, and grand chief Fountaine. The article exposed the



underestimations done by the federal government, and new data on the housing crisis. The article seemed consistent with the information on housing presented in the First Nations studies class I took in, therefore all though the facts were not all that new, the data was presented well and the accompanying interviews provided an interesting perspective. If I decided to go with this topic in my thesis, I think this could provide great perspectives to include in my research.

Khennas, S., Dunnett, S., Piggott, H. (2003). *Small wind systems for rural energy services*. London: ITDG Publishing.

Though this book is more of a guide to using wind sources to provide energy to developing nations, the information it provides is very applicable to our rural First Nations communities. Some indigenous communities have limited access to the grid, or are simply wanting to be better stewards of the environment, and are turning to greener energies. This book contains the pros and cons of wind power (Chapter 1), a simplified explanation of how the technology works (Chapter 2), a guide to estimating the energy potential and choosing a site for the generator (Chapter 3), how to assess the energy needs of the community (Chapter 4), The economics of the system (Chapter 5), Examples of communities and countries that have embraced wind energy, and policy recommendations to promote wind systems (Chapter 6). As a large part of my thesis will likely look at the ability of various energy systems to enhance quality of life on reserves I found this book to have all the important information while still being brief and to the point.

McCartney, S. (2016). Re-thinking housing: From physical manifestation of colonial planning policy to community-focused networks. *Urban Planning*, 1(4), 20-31

This article was not based on original research but rather synthesized the history of housing on reserve and looked at different ways to address the glaring problems. It acknowledges that the cheaply built homes were built for nuclear families in the colonial style to encourage assimilation and adoption of patriarchal and cultural beliefs. This has led to present day problems of overcrowding, mold, and structural damage. It is stated

that these changes not only caused cultural damage, but may be the root of many health and social problems. The article also emphasizes the importance of creating dialogue between community and state that address the unequal power dynamics and cultural conflicts, acknowledging the damage of historical and present day policies, and the power of shifting to a community driven planning structure including traditional knowledge and ways of knowing to work on the process of decolonization. Although this article did not bring about any new data, the analyzation of historical events and emphasis on policies nicely summarized the issues and brought an interesting perspective on how to start working towards solutions with planners taking on a different role and frameworks being rebuilt to suit community needs. It seemed like an interdisciplinary piece the way it wove in law, history, and culture.

This study was driven by the discussion around the Truth and Reconciliation Commission. The article helps to facilitate that discussion by looking at how planning can lead that shift to a better relationship. The research questions includes how is “discourses...used to shape the existing housing system” (p.20) and can the government use planning (in the form of changed a housing system and policies) to lead the relationship building between the Indigenous peoples and government. These arguments are similar to ones I have heard many times before but rarely seen in a scholarly journal. I think that the perspective it brings forth can help researchers and policy makers who don’t have first hand experience in these communities get a more complex understanding of the issues at hand.

Optis, M., Shaw, K., Stephenson, P., & Wild, P. (2012). Mold Growth in On-Reserve Homes in Canada: The Need for Research, Education, Policy, and Funding. *Journal of Environmental Health*, 14-21.

According to this article just under half of the homes on reserve had levels of mold that affect health. It goes on to discuss what causes mold and why it thrives in reserve housing, the effects these mold levels have on the residents and aboriginal

people as a whole, what is being done about it, and what should be done about it. This is not just a health problem, but a social one as it is “due to a series of historical and socioeconomic factors, including disenfranchisement from traditional territory, environmentally inappropriate construction, high unemployment rates, lack of home ownership, and insufficient federal funding for on-reserve housing and socioeconomic improvements” (p.14). It touches on several topics I want to discuss in my paper such as what housing looks like, the impacts mold is having and the four recommendations they have to fix the problem moving forward (recommendations on page 19 included thorough testing and data on aboriginal health and homes, proper mold prevention education, and government commitment to remediate the root socio economic problems). The article does a great job of evaluating the problem through a scientific lense while still understanding the outside factors that lead to the mold epidemics. It is easy to read and very informative, most health article on indigenous peoples aren't able to make such deep connections to the root issues and these authors did a great job at writing a convincing article. At least three of the authors are professors at University of Victoria from different fields which must be why this article seems fairly interdisciplinary (note to self look more into Dr. Shaw's research). They have a very extensive list of sources some of which I am planning to read myself moving forward as they seem to pertain to my research. If my thesis stays true to my plan this information will be ideal in justifying a need for change and how mold resistant building materials such as cob may be a well suited solution.

Prusak, Y. S., Walker, R., Innes, R. (2016). Toward indigenous planning? First Nation community planning in Saskatchewan, Canada. *Journal of Planning Education and Research*, 36(4), 440-450.

The article examines the effect of a planning pilot project implemented on eleven different reserves in Saskatchewan between 2006 and 2011. The planning project was administered by a consulting team contracted by and following the processes set forth by the Department Aboriginal Affairs and Northern Development Canada at the time. The examination consisted of qualitative analysis, in the form of interviews, with 36

participants. The general consensus of the interviews was that although some band members assisted in carrying out the planning process, the planning project was an exercise in colonial control and ideals. However, it resulted in the Indigenous communities having a greater appreciation for the value of visioning the future of the reserve and the need for institutional development. It created a base for the community so that they could move away from the colonial framework and examine what their Indigenous planning would look like. It is believed by the researchers and participants that planning could be used to help practice self determination. The study's participants included both the local level planning groups and band administration and members of the planning consultant team and AANDC. This study was created because the researchers noticed a disconnect between the planning process being implemented by AANDC and the literature being produced advocating for a different approach to Indigenous planning. The researchers saw this as a possible problem and wanted to explore how people felt about the outcomes.

This study wanted to examine the successfulness of the pilot project through the people involved. It was important to examine "successful" through the participants rubric not the benchmarks and standards set out by AANDC. The thesis appears to be does "the work carried out during the pilot project coincides with advances in research on planning with Indigenous communities and the emergent paradigm of Indigenous planning." It provided a fresh perspective by examining whether the government programs were making an impact by local standards, rather than being measured by government standards. I think the study really demonstrates the importance of Indigenous peoples' taking control of their own planning process and being involved at every level. Outside consultants can be a useful aid, but it has to be community driven.

I found the perspectives in this article to be very interesting. It surprises me that even still AANDC seem to think they know what is best for a community rather than taking the time to really understand the planning and development needs of that individual community.

Vera, I., & Langlois, L. (2007). Energy indicators for sustainable development. *Energy*, 32(6), 875-882

Vera and Langlois' article examines and summarizes the creation and implementation of a set of indicators for energy goals to supplement the sustainable development goals/indicators already in place. The international agencies involved included two branches of the United Nations, two European Union Agencies, and the International Energy Agency (as a part of the Organization for Economic Cooperation and Development). These parties recognized that at the time there were an estimated 1.7 billion people globally that did not have access to electricity. These organizations believed this lack of energy greatly limited the socio economic development capabilities in limited energy areas. Therefore a need for energy creation exists.

The article goes on to explain sustainable energy development indicators are desired to "provide an analytical tool for assessing current energy production and use patterns at a national level." In 1995, prior to the aforementioned partnership, the UN created Indicators for Social Development (ISDs) which contained three energy related indicators (of the 58). These international agencies began partnering in 2002 to complement the ISDs. In 2005 the report was released containing 30 Energy Indicators for Sustainable Development (EISDs) along with methodologies for implementation and other guidelines for each indicator. Additionally, case studies were released testing and implementing the EISDs.

The paper extensively outlined the history leading up EISDs and examined the indicators individually along with explaining their classification system; however, this paper does not contribute any original research or idea except for a single concluding sentence assessing the EISDs to be an "effective tool for policy makers." It does, however, a very good job at explaining the various events that lead to the EISDs and detailing each indicator in a straightforward fashion.

Personally, I began reading the article with no knowledge the EISDs existed, and finished feeling I had a pretty broad understanding of the report's content and its purpose. The article was detailed while still being easy to read even by those from outside the field. As I am going to focus a lot on sustainable energy in my thesis, I think this resource will be good to compare different technologies to the sustainable energy indicators and give guidelines on how to implement them in the community.

Wazyatawin, A. (2016, Oct 5). Wazyatawin: "Regenerating the Roots of Indigeneity: Resurgence & Resilience in Troubling Times". [Video File]. Retrieved from <https://www.youtube.com/watch?v=pCMuo6oMf5w&t=2707s>

This lecture is what inspired my thesis. The beginning of the lecture focuses on fossil fuels, sustainability, and protecting the environment. At 24:30 she quotes Derrick Jensen and Aric McBay saying "If you invent a new technology that depends on unsustainable infrastructure, your technology is simply not going to be sustainable." She has exemplified this idea of powering down, using appropriate technologies, and being sustainable. Starting at 25:25 Dr. Wazyatawin talks about buying land next to her reserve and building an earthen home to address her reserve's housing crisis in a natural way. As many/most Indigenous people view the earth as mother, she talks about how comforting it is to "be swaddled in the body of mother earth" (31:30s) and wanting to "build a home made of earth that is ancient, solid, and loving" (32:50s). She spoke of the necessity to use straw bales as insulation when building earth homes in cold weather climates (apx.34mins). She started by building a compost outhouse of cob (clay, sand and straw) to practice working with the material. She referred to making cob structures as a democratic process, as anyone, children and elders included, can help with the process with no machinery. She found it empowering especially for women who have often felt they couldn't be involved in the building processes (apx. 35mins). At the 40 min mark she talks about masonry heaters and rocket mass stoves as being the most efficient (see the Wisner article). She also talks about farming their own trees and permaculture "farming" as access to traditional gathering grounds are limited. (42-46:00). The way she talks about how it is impossible to "go back" to the traditional lifestyle and how using these improvements on ancient technologies can help regain those traditional ideologies and become proper stewards of our homelands. Their goal is to "find the joy that we can in the handmade life while living lightly on the earth, so that we can nurture life." (47:36-47:44).

The lecturer is an advocate of the Dakota people, author of several books, and has taught at Arizona State University and UVIC. Note: I found this as possibly being her

email address wazyatawin@gmail.com , I may want to contact her personally as she inspired my research and could add context and details to my work.

Wisner, E. & Wisner, E. (2016). The rocket mass heater builder's guide. Gabriola Island, BC: New Society Publishers.

In order to get a better understanding of some of the more sustainable technologies available, I took out some books from the public library including this one on rocket mass heaters. Rocket mass heaters are slow release radiant heaters that use dried firewood as fuel. The system uses a narrow, well insulated chamber to maintain a clean, hot fire. Because the fire burns sideways at very hot temperatures, the design actually burns the smoke leaving almost pure steam and a little mineral ash. What makes it unique is that they provide quick radiant heat and steady stored heat. The system is easy to lay out and install, it can be designed and built using "local, earth-based recycled, and reclaimed resources" ( p.2). A lot of the structure can be built using cob and an old metal barrel. The major appeal of rocket mass heaters is that it can offer a great heat source while living off-grid. I found the book easy to read with reasons why one would choose a rocket mass heater and directions on how to make one. I think these are a cool technology because not only are they easy to make, they burn significantly less wood than traditional fireplaces/woodstoves and produces less CO<sub>2</sub>. A lot of homes on reserve rely on wood stoves and upgrading to something like this would be a lot cheaper than installing a new central heating system while still remaining sustainable. The book even had information on building codes and navigating them in Canada. It was very comprehensive and enlightening.

## Proposed Logistics

### Proposed Timeline

By the Second week of May – Finalize Supervisor and Readers

By the end of June – Meet with supervisor and discuss expectation and ideas

By the end of August – Complete preliminary research with a thorough annotated bibliography

- Redo outline with more focused topics

By the end of September – Meet again with supervisor (preferably organize monthly check ins)

- Complete apx 12 pages

By the end of October - Complete apx 24 pages total

By the end of November – Complete apx 35 pages total

By Dec 22<sup>nd</sup> – Finish First Draft of thesis

- email update readers on progress and expected completion dates

By end of January – 1<sup>st</sup> edit – Rewrite and revise content and style

- Evaluate / Implement Supervisor Suggestions

By mid February – 2<sup>nd</sup> edit – proofread for spelling/grammar/formatting

By the end of February – Have a third party critique paper (ie. writing centre or peer)

By the end of March – Put paper in final form and make defense preparations

By the end of April – Defend Thesis

### Proposed Supervisor and Readers

- Lisa Cooke (Anthropology)
- Michael Mehta (Geography and Environmental Studies)
- Joel Wood (Economics)