Sustainable Development for Canada's Arctic and Sub-arctic Communities: A Case Study of Churchill, Manitoba

By

Steven Timothy Newton

A thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements for the degree of **Master of Natural Resources Management**

Natural Resources Institute
University of Manitoba
Winnipeg, Manitoba

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

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Abstract

Canada's *Oceans Act* (1997) promotes the need for the sustainable development of oceans and their resources. Coastal communities are an integral component of Canada's oceans, and therefore need to be considered under the *Act*. Many of Canada's northern coastal communities share characteristics such as isolation, high aboriginal representation, high unemployment, and susceptibility to climate change, which will have a strong bearing on how sustainable development should be promoted. The purpose of this research was to develop a better understanding of the relationship between sustainable development and characteristics specific to northern coastal communities. Using Churchill, Manitoba as a case study, the researcher analyzed the environmental, social and economic aspects of sustainable development from the perspective of a small sub-arctic coastal community.

This research was based on literature reviews, mapping and interviews with local townspeople (n=54). A backcasting framework was used to evaluate the data, and concentric rings were developed to illustrate annual social, economic and environmental activities. The establishment of the Nunavut Settlement Region, increased tourism and Port expansion are ushering in a new set of opportunities for the Town. However, some concerns were identified with respect to the social, economic and environmental aspects of Churchill. Environmental concerns included tundra vehicle damage, and the environmental impact of former military dumps, derelict buildings and gravel pits. Key social concerns included alcohol abuse in the community and a lack of sufficient youth programs. Economic concerns included the development of shoulder seasons and the future economic viability of the Hudson Bay Port Company. In conclusion, the *Oceans Act* and contributions from this study may help to ensure that social, economic and environmental activities in Churchill adhere to the principles of sustainable development.

Acknowledgements

The research for this thesis turned out to be quite an adventure, from beluga whale watching to exploring abandoned rocket ranges and discovering relic aboriginal communities. Throughout this process I have learned a great deal from the community of Churchill and from those who supported me in the development of this project.

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A very special thanks to my research partner, Ms. Sara E. Melnyk for her all her help in conducting the fieldwork and overall preparation of this document. I would also like to thank Mr. Ryan T. Tombs for assisting me in the development of the concentric rings, and the rest of the Monty's gang for the lunchtime refreshments.

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Glossary of Terms

1. Sustainable development: A process rather than a state of affairs, that refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987).

2. Sustainability: The ultimate goal of sustainable development that involves a shift in consciousness whereby intergenerational equity is accepted as an overriding concept (Jodha 1992). It is characterized by long-term continuing ecosystems capable of supporting human life, social well-being, supported by a vibrant economy and sustained by a healthy environment (Dovers 1989).

3. Research interview: A two-person conversation, initiated by the interviewer for the specific purpose of obtaining research-relevant information, and focused by the interviewer on content specified by research objectives of systematic description, prediction, or explanation (Patton 1990).

4. Interview schedule: A list of questions or issues that are to be explored in the course of an interview. It is prepared in order to make sure that basically the same information is obtained from a number of people (Patton 1990).

5. Town of Churchill: Located in northeast Manitoba 58^0 47'N, 94^0 12' W on the southwest shore of Hudson Bay at the mouth of the Churchill River. The Town supports a population of approximately 1000 people.

6. Sustainable Livelihoods: "A livelihood comprising the capabilities, assets and activities required for a means of living. A livelihood is sustainable which can cope with and recover from shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation, and which contributes net benefits to other livelihoods at local and global levels in the short and long term" (Chambers and Conway 1999 p. 106).

7. Integrated Management: Integrated management of activities in, or affecting, Canada's estuarine, coastal and marine waters, fosters sustainable development while maintaining or enhancing the health of these ecosystems. Integrated management is an ongoing and collaborative approach, which brings together interested parties to incorporate social, cultural, environmental and economic values in the development and implementation of comprehensive plans and management processes (DFO 1999d).

8. Generation: The average span of time between birth of parents and that of their offspring, generally considered to be 25 years (Black's Law Dictionary 1990).

9. Industry: A department or branch of a craft, art, business, or manufacture, especially one that employs a large personnel (Webster's New English Dictionary 1999).

10. Development: To expand or realize the potentialities of, bring gradually to a fuller, greater, or better state. It has both qualitative and quantitative characteristics and is to be differentiated from growth which applies to a quantitative increase in physical dimensions (Berkes and Folke 1992).

Chapter 1

Introduction

1.0 Background

In 1979, the *Government Organization Act* established the Department of Fisheries and Oceans (DFO) as the lead federal department with respect to oceans policies and programs (DFO 1998a). More recently, the 1997 *Oceans Act* required the Department to be the lead agency in the development of a national Oceans Management Strategy (OMS) (DFO 1998b). The international context for the OMS is based on the 1982 United Nations Convention on the Law of the Sea (LOSC), and the 1992 United Nations Conference on Environment and Development (UNCED). The 1982 LOSC provides a framework for the OMS through the Exclusive Economic Zone (EEZ) – a multipurpose development zone for all uses and resources that takes into consideration the interaction of uses and management. The UNCED process resulted in the establishment of local, regional and international oceans and coastal initiatives (DFO 1999b).

The purpose of the OMS is to develop a flexible strategy that can be implemented regionally by stakeholders within their areas of responsibility to manage activities occurring in or affecting marine waters (DFO 1999b). An important component of the *Oceans Act* (1997) and the OMS is to foster the sustainable development of Canada's oceans and their resources. Sustainable development is defined as a process of social, economic and environmental development that meets the needs of the present without compromising the ability of future generations to meet their needs (WCED 1987). This

definition is echoed in the *Oceans Act* mandate, "to ensure healthy, safe and prosperous oceans for the benefit of current and future generations" (DFO 1998a p. 3).

Canada's oceans play a major role in the environment, economy and social well-being of the country. Canada supports the world's longest coastline, 23% of Canadians live in coastal communities, and ocean waters account for about $135 billion in economic activity (DFO 1998a). The oceans sector of the Canadian economy is broadly defined as including fishing, shipping, boating, tourism, oil and gas, marine defence industries, and oceans-related manufacturing and services. However, there are a number of unique challenges facing Canada's oceans including marine conservation and environmental protection, land-based sources of pollution, marine and public safety, and how the activities of coastal communities affect ocean resources (DFO 1998b).

Fostering sustainable communities in Canada's arctic and sub-arctic poses many unique challenges. Some of these challenges include isolation, high aboriginal representation, high unemployment, and susceptibility to climate change (McTiernan 1999). This research uses Churchill, Manitoba as a case study, in order to develop a better understanding of the relationship between sustainable development and characteristics specific to Canada's arctic and sub-arctic communities.

The Town of Churchill is located in northeast Manitoba (58°47'N, 94°12'W) (Figure 1). This community has experienced unique developmental challenges and is economically, socially and environmentally linked with coastal and marine resources. It is approximately 966 km by air and 1,697 km by rail from Winnipeg, the capital city of Manitoba. Surrounding the Town is a region composed of a diverse mix of habitats, from arctic marine waters, to treeless tundra, to boreal forest. The Town itself has a population

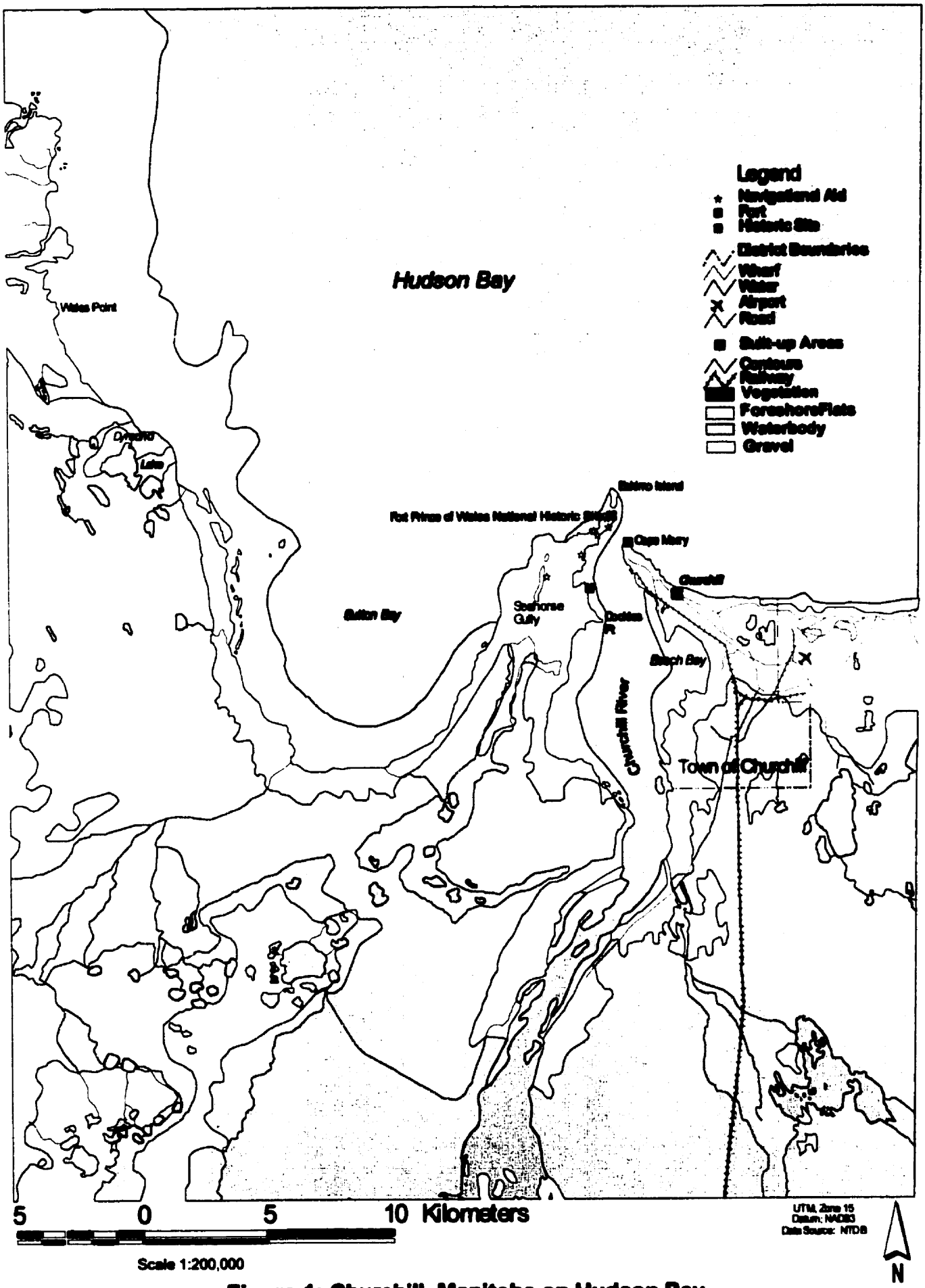


Figure 1: Churchill, Manitoba on Hudson Bay

of approximately 1000 people, with about 50% of that population being Cree, Inuit and Dene (Town of Churchill 1999). The population of Churchill has experienced a steady decline since the 1960s when military operations were transferred out of the community. The resident population according to the Federal Census was approximately 7000 in 1965, 1604 in 1971, 1217 in 1986, 1143 in 1991, and most recently 1090 in 1996 (Census Canada 1996).

The most recent statistics on employment in Churchill indicate that the Hudson Bay Port Co., Regional Health Authority, Town of Churchill, Churchill Airport, NTCL, and Northwest Territories Transient Centre employ the majority of the working population. This includes full and part-time employees (See Table 1). It is estimated that the tourism industry employs 130 people directly and 50 indirectly in the community (Town of Churchill 1999a). Unemployment levels in Churchill are fairly high (21%) in comparison to the rest of Manitoba (8%), due in part to the seasonal nature of the employment (Census Canada 1996).

The Town of Churchill has experienced wide-ranging developments over the last seventy years, including shipping, military outposts, tourism, rocket research, and hydro development. During the last forty-five years, a major focus of economic development in the Town has been shipping through what is today called the Hudson Bay Port. This Port is the only inland, deep-sea port in Canada. Owned and operated by OmniTRAX International, it has the capacity to clean and store grain in a 140,000 tonne grain elevator in preparation for the shipping season. While ocean-going vessels primarily arrive to take grain and other commodities to Europe, South America, and Africa, the Port also has the capacity and potential to import a variety of products from off-shore. Resupply of

fuel and groceries to the communities along the Hudson Bay coast by the Northern Transportation Company Limited (NTCL) has become another important function of the Port (OmniTRAX 1998).

Table 1: Employment Figures in Churchill, Manitoba (Town of Churchill 1998)

Type of Employment	Number Employed
Government and Industry Installations	
Hudson Bay Port Co.	3 Full-time/ 100 seasonal
Regional Health Authority and Community Services	100
Town of Churchill	37 Full-time/11 Part-time
Churchill Airport	45
Northern Transportation Company Limited	40 seasonal
Northwest Territories Transient Centre	16
Business and Professional Services	
Food and Beverage Group (Liquor, Bakeries, etc)	14
Automotive Group (Service Stations, Repairs, etc.)	7
Professional Group (Accountants, Dentists, etc.)	6
General Merchandise Group (General Stores)	5
Furniture, Appliances and Home Accessories	4
Financial Group (Banks, Credit Unions, etc.)	1
Other Groups (Sporting Goods, Shoe Repairs, etc)	25

Recent tourism development has provided another important industry to the community of Churchill. Tourism has become an important source of livelihood for the community, and accounts for at least 40% of the local economy (Town of Churchill 1999). The community and surrounding areas have become a popular tourist destination primarily due to the presence of polar bears, beluga whales, and major bird populations.

Churchill is known as the "Polar Bear Capital of the World", because it boasts one of the largest denning areas in the world. Although fall is the best time to view them, the bears have been spotted in Churchill every month of the year. In June, thousands of beluga whales arrive at the estuaries of Hudson Bay to feed on caplin, to mate, calve and moult. These whales reach four to five metres in length and weigh 360 to 400 kg. Close to 200 species of birds have been observed around the Town. The marine coastline is extremely important to bird habitat and migration and the Ross's Gulls, snow geese, Canada geese, ducks and ptarmigans are in abundance. Raptors such as peregrine falcon, rough-legged hawk and snowy owl can also be found throughout the Town (LGD 1996).

Although tourism has enjoyed recent economic success in the community, most other development projects have been unpredictable and relatively short-lived. Some of these projects have had negative environmental, economic and social impacts on the community. Military activities of the early 1950s and 1960s continue to impact the environment due to negligent dumping of waste and long-term scarring of the landscape. The diversion of the Churchill River in 1977 for hydroelectric generation reduced water flows by 75%, and impacted the aquatic ecosystem to the extent that today there are very few shore birds and fish species in the river. The rocket research range was another development that negatively impacted the local environment. Debris from the rockets can be seen strewn across some areas of the Town of Churchill. There are also a number of issues associated with the growth of tourism in Churchill. Studies have shown that the increase of vehicles and pedestrian traffic may compromise the ecological integrity and habitat of the Town (Manitoba Housing Authority 1999).

Although the community has been negatively impacted by previous developments, a number of positive growth areas are emerging. Establishment of the Nunavut Settlement Region in Canada's eastern and central Arctic in 1999 may increase Hudson Bay Port shipments, through new ties between the Governments of Manitoba and Nunavut. There is also a potential for growth through hydroelectric generation. Possible extension of the tourism seasons may also help to diversify tourism and provide more employment in the community. The Hudson Bay Port Company under OmniTRAX Inc. is likely the largest potential growth area, with renovations and Port expansion currently underway.

1.1 Purpose Statement

Canada's *Oceans Act* (1997) promotes the need for the sustainable development of oceans and their resources. Coastal communities are an integral component of Canada's oceans, and therefore need to be considered under the *Act*. Many of Canada's northern coastal communities share characteristics such as isolation, high aboriginal representation, high unemployment, and susceptibility to climate change, which may have a strong bearing on how sustainable development should be promoted. The purpose of this research was to develop a better understanding of the relationship between sustainable development and characteristics specific to northern coastal communities. Using Churchill, Manitoba as a case study, the researcher analyzed the environmental, social and economic aspects in order to identify aspects of sustainable development unique to northern coastal communities.

1.2 Research Objectives

The specific objectives of the study were:

1. To document community perspectives on the social well-being, environment and economy of the Town of Churchill;
2. To review and analyze literature on Churchill's history, sustainable development, communities and frameworks;
3. To analyze community perspectives and development options from the perspective of sustainable development; and
4. Using Churchill as a case study, to draw conclusions and make recommendations concerning sustainable development for Canada's northern communities.

1.3 Methods

The methods used in this study were:

1. initial site visit: The researcher spent May 10-17, 1999 in Churchill, Manitoba. The purpose of this trip was to familiarize the researcher with the environment and people in the community. The researcher met and conducted interviews with community members in Churchill. The researcher also traveled through the Town, gaining a fuller sense of the environment and activities in and around Churchill.
2. literature review: The bodies of literature concerning sustainable development, communities, and frameworks were reviewed. Reference material was obtained from literature and Internet searches, reviews of related environmental assessment reports and contacts with individuals possessing relevant expertise. Information was provided orally and in writing. Publications (reports, books and periodicals) were also reviewed and relevant information was extracted for use.

3. development of baseline map: A baseline map of the proposed study area was an important tool for this research. The map was developed with the use of Geographic Information Systems (GIS). It delineates the extent and geographic scope of the study, as well as the variety of development uses in the area. This map was used in the informal interviews with community stakeholders to illustrate uses and development in Churchill.
4. interviews with an interview schedule: Patton (1990) defined the research interview as "a two-person conversation, initiated by the interviewer for the specific purpose of obtaining research-relevant information, and focused by the interviewer on content specified by research objectives of systematic description, prediction, or explanation" (p.30). The interview schedule provided topics or subject areas within which the interviewer was free to explore questions that illuminated the particular subject area.

The interview schedule helped make interviewing across a number of different people more systematic and comprehensive by establishing in advance the issues to be explored. Interviews were held with fifty-four community members in Churchill. These community members included tourism operators, OmniTRAX representatives, NTCL consultants, economic development officers and others. Interviews with community members were conducted in order to obtain information on the interviewee's personal, social and cultural backgrounds, as well as their views on social, economic and environmental aspects of Churchill. The interviews also furthered the researcher's knowledge of each development activity, and elicited individual recommendations for future sustainable development in Churchill. A copy of the interview schedule is provided in Appendix A.

5. participant observation: Participant observation facilitates interaction and understanding between the researcher and community members during research and data collection. Using this technique, the researcher "gathers" data by participating in the daily life of a group or organization (Burgess 1982). Participant observation was employed in Churchill to allow the researcher to more fully understand the culture and uniqueness of this remote northern community. The researcher was able to establish relationships with some of the community members in Churchill, which in turn created a more relaxed interview process.
6. development of annual concentric rings: A poster was developed depicting the annual social, economic and environmental activities in Churchill. The information for the poster was gathered through the literature review and informal interviews with the community members. The poster was developed using Adobe Photoshop and Illustrator.
7. confirmation visit: On September 7, 1999 the researcher traveled back to Churchill to confirm the research results with the community. The researcher developed a poster, several graphs and information sheets to illustrate the results and progress of the research conducted in their community. The information was disseminated to the community through presentations at the local high school and a display booth in the Churchill Town Centre. Advance notice of these presentations were made on the local television network.
8. analysis of research findings: The analysis and discussion of the research findings were conducted with a backcasting approach. The backcasting approach has its starting point as the definition of a desired situation at a determined point in the

future. This leads to the development of a scenario that connects the present status with the desired future point. This detailed, quantitative and qualitative approach gives insights into the challenges that lie ahead in order to realize the goal. This particular backcasting approach began with a description of what Churchill would look like in 25 years, if it were sustainable. The results of this approach are presented in chapters five and six.

1.4 Organization of the Study

This research document consists of six chapters. Chapter 1 provides background and context for the study, and outlines the methods used in this research. Chapter 2 presents a review of literature on the theoretical basis of sustainable development, communities, and frameworks. Chapter 3 describes the history of development in Churchill. Chapter 4 presents the results of the interviews with stakeholders in the community of Churchill. Chapter 5 links and analyzes the literature review and community responses to form a future sustainable scenario of Churchill in 25 years. Chapter 6 draws conclusions and makes recommendations concerning sustainable development in Churchill and considers their relevance for other northern communities.

Chapter 2

Literature Review of the Theoretical Basis of Sustainable Development, Communities and Frameworks

2.0 Preamble

This chapter reviews the literature on sustainable development and sustainable communities. It also reviews how sustainable development can be measured at the community level. The chapter concludes with a review of two existing frameworks used for assessing sustainable development in other areas, and evaluates their applicability to Churchill, Manitoba.

2.1 Theoretical Basis for Sustainability and Sustainable Development

In 1983, the United Nations Secretary-General called for an independent commission to look at the speed with which the earth's environmental resources were being degraded. Although there is some dispute over the rates of degradation, commonly acknowledged effects include loss of biodiversity and cultural diversity, thinning of stratospheric ozone, climate change and the collapse of natural resource stocks (Bartelmus 1993). Between 1983 and 1986, the World Commission on Environment and Development studied, debated, held public hearings and ultimately produced a report titled, "Our Common Future: the Brundtland report". The concept of sustainable development was first outlined in this report, which has since been accepted by the United Nations and the international community (WCED 1987).

The Commission defined sustainable development as a process rather than a state of affairs, that refers to meeting the needs of the present generation without

compromising the ability of future generations to meet their own needs (WCED 1987). Sustainable development, as expressed in the WCED report, is a process for changing the character of society. Sustainable development assumes fundamental changes in the way business is done, what is taught to children, how individuals live and conduct their lives and how government and societies' public institutions address the essential problems affecting daily life (WCED 1987).

Sustainable development, as described in this report, is an approach to guide individual and collective behavior with respect to the environment (the life sustaining processes of the earth and its natural resources), the economy (the provision of jobs, incomes and wealth resulting from economic activity) and human health and well-being. The goal of sustainable development is to reach a state of sustainability that is defined as a shift in consciousness, whereby intergenerational equity is accepted as an overriding concept (Dovers 1989). Sustainability is characterized by long-term continuing ecosystems capable of supporting human life, social well-being, supported by a vibrant economy and sustained by a healthy environment (Jodha 1992).

Since sustainable development is a process towards the goal of sustainability, it cannot be reached in a single step. Therefore, attention must be focused on the intermediary sustainable development steps needed to achieve it. These steps include local empowerment, using products in continuous cycles, and diversifying the economy. However, Dovers (1989) recognizes the difficulty in implementing sustainable development. There is a high degree of variability of what sustainability will mean in any particular context. In any real-world situation, the meaning and implications of the

concept will be subject to countless mitigating factors. Only in a local context will a concrete idea of what sustainability means emerge.

Many people confuse the terms sustainable development with sustainable growth, however, in reality these terms have very different meanings. Growth is defined as an increase in physical size. Growth in the economic sense is inextricably associated with the throughput of resources of materials and energy (David 1993). All such processes, including those in industry and the home, involve pollution and waste. If growth continues, these pollutants and wastes will continue to flow. Therefore, "growth" is not sustainable in the long-term, and is not a component of sustainable development.

Development, on the other hand, means realizing the potential of a given resource, or bringing it to a fuller or better state. One definition of development is economic development that keeps within the limits of natural carrying capacity. That is, development that does not do irreversible harm to the natural environment, protects natural systems, does not over-exploit renewable resources, and uses non-renewable resources sparingly (Ekins 1990). Others see this as too narrow a view. They argue that development should mean human, as well as economic and environmental development, measured in terms of the health of human communities as well as that of the natural environment. According to this view, sustainable development necessarily involves taking social equity into account: that is, not just how much development and of what kind, but how its benefits are distributed (Berkes and Folke 1992).

2.2 Introduction to Sustainable Communities

The World Commission on Environment and Development's report "Our Common Future: the Brundtland report" (WCED 1987), which popularized the concept

of sustainable development, provided very little guidance to Canadians trying to implement the concept of sustainable development at the community level. Since 1987, however, a number of different agencies have attempted to operationalize the concept of sustainable development at the community level. The purpose of this section is to review the literature on sustainable communities, and show the range of characteristics, processes and initiatives that are used to define and/or describe sustainable communities.

The term "community" has several different meanings. Sometimes it is used to mean an identifiable place, much like a locality, settlement or municipality. It can also mean a group of people sharing an interest or identity. Probably the most common use of community, though, involves both of these ideas: that is, a group of people living in the same place and to some extent having a sense of identity and shared interests. In this document, community is used in this sense, so the term has both a human/social and a physical/spatial aspect (Aberley 1989). It is helpful to think of a human community as a local human ecosystem comprised of: people; the natural environment of climate, air, land, water, and biota or living things; the built environment of buildings, streets, etc.; and the complex network of functional relationships among all of these (Roseland 1992).

A community defined in terms of sustainable development means, the pursuit of modes of economic development that are not just "environmentally friendly," but which also offer the community long-term economic stability, diversity and prosperity. It means a deliberate, broadly based attempt to achieve social health and individual well-being. It means a concerted, long-term program not just to clean up the environment, but to conserve and enhance the community's natural assets of land, water, air and living things. Furthermore, a sustainable community is one that does not seek its own

development at the expense of the development of other communities (Berkes and Folke 1992).

2.2.1 Economic Sustainable Development

Although the economy is frequently written about and spoken of as if it were somehow separate from society in general, it should really be seen as that part of a system that enables certain specific human needs to be met (Henderson 1990). This view of the economy is central to community sustainable development. The economic side of building a sustainable community involves the active pursuit of economic development, not as an end to itself, but as the means of providing the community with the resources needed to achieve social and environmental sustainability (Richardson 1993).

A sustainable economy means building a local economy that is both stable and diversified. The economy should be based on future oriented enterprises that can endure within changing global and national economies without relying on artificial supports. Sustainable economic development programs do not focus on attracting large firms from outside. Instead, they concentrate on diversification, building on local strengths and resources, and encouraging local initiative. A strong local or community based sector in the community's economy will not only enhance its stability and increase both the number and the variety of jobs, but will also be committed to the community and responsive to its needs. This implies support for small home-grown enterprises making use of local skills and resources, perhaps even for community or municipal ownership of utilities or enterprises in some circumstances (Doering 1991). Although community economic sustainability means much more than trying to improve the performance of

enterprises that pollute the air or the water, the sustainable community economy is not environmentally destructive in its resource demands (Doering 1991).

2.2.2 Social Sustainable Development

The concept of social sustainable development is defined as, "a community that is continually in the process of creating those physical and social environments and enhancing those community resources, which enable people to mutually support each other in fulfilling all the functions of life and attaining their full potential" (Roseland 1992 p. 92). The idea of social sustainable development was born in the public health field out of the recognition that personal health is more than just freedom from illness, but is positive wellness in the sense of ability to realize one's full physical and mental potential. According to Roseland's definition, sustainable community means:

1. the satisfaction of basic human needs for food, shelter, education, work income, and safe living and working conditions;
2. equity, which involves a fair distribution of the benefits of development;
3. enhancement, or at least maintenance of physical, mental and social well-being;
4. education and the opportunities for development of human potential for the whole population; and
5. a democratic government that promotes citizen participation and involvement (Roseland 1992 p.88).

2.2.3 Environmental Sustainable Development

The earliest European settlements in Canada existed at a level that could be considered environmentally sustainable. Forests were cleared to permit farming and to supply wood for construction and fuel, and fish were caught and wildlife hunted and

trapped, but at first the impacts of the newcomers on the natural environment were relatively small in scale. Furthermore, the new settlements were to a great extent self-sufficient in meeting their everyday needs (Roseland 1992). In contemporary Canada, with its industrialized, highly integrated economy, its enormous consumption of both materials and services, and its correspondingly heavy production of solid, liquid and atmospheric wastes, it is difficult for any ordinary community to approach that level of sustainable development. In fact, to satisfy the diverse demands of a modern Canadian community requires the resources produced by a vast area of land, not only in Canada but worldwide (Roseland 1992).

Nevertheless, there is a great deal that every community can do to move towards a greater degree of environmental sustainable development. Fundamentally important, again, is to see the community in ecological terms and recognize that the environment is not a collection of discrete items, but an ecosystem in which all these relate to each other and to people (Hancock 1993).

2.3 Community Self-reliance

The notion of community self-reliance is another major theme in the sustainable community literature. Many communities have recognized that achieving a level of self-reliance is vital to sustainable development (Henderson 1990). CalOAT (State of California Office of Appropriate Technology) (1981) is an agency that has pioneered the development of many sustainable community themes. CalOAT gives examples of their vision of community self-reliance: a democratic, co-operative society in which local producers use local resources to satisfy local needs. Every community has resources, ranging from the sunlight falling on the community to the skills, labour, and time of its

residents. Self-reliant communities put these resources to work responding to local problems and meeting needs for food, energy, housing and health care.

Morris (1982) argues that three major factors work together to encourage local self-reliance:

1. the increased cost and decreased availability of raw materials, which leads people to favour more abundant and renewable materials, to recycle scrap products, process materials locally, and generate energy nearer the end user;
2. new technologies, which allow more people to generate wealth from their homes; and
3. the electronics revolution, which has allowed people to better monitor their environment and understand their relationship with it.

Governments can help a community move toward sustainability, but the initiative and the continuing, cooperative effort must come from within, reflecting the character, the determination, and the consensus of the community itself. The best starting point is the development of a common vision, a shared picture of the kind of community its members want their children and grandchildren to live (Roseland 1992).

While a shared community vision is fundamental, it is only the first step in sustainable development. More sharply defined goals have to be agreed, specific objectives set, priorities established, work programs laid out. All this involves a sharing of responsibilities. The leadership and coordination should reflect and represent the community as a whole, but most of the work will be done by individual organizations, groups, and people. The quest for community sustainability does not replace the many diverse efforts already being made for the community's well-being. Instead, it links and builds on them.

2.4 Sustainable Livelihoods

According to Turner (1993), any sustainable community strategy for the future will have to confront the question of how a growing number of people can gain at least a basic livelihood that can be sustained in the long term. A livelihood, as described by Timlin (1996), is defined as the means that people employ, that is, the activities in which they engage to secure access to food, water, health care, clothing, shelter, and security. Sustainable livelihoods can be described as the ability of local people to generate and maintain their means of living for the present and future generations (Berkes and Gardner 1997). This is especially critical in environments that are fragile, marginal and vulnerable (Chambers and Conway 1992).

Chambers and Conway (1992) present a working definition of sustainable livelihoods, "A livelihood is comprised of the capabilities, assets and activities required for a means of living. A livelihood is sustainable which can cope with and recover from shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation and which contributes net benefits to other livelihoods at local and global levels in the short and long term (p. 106)."

Inherent in this definition is an emphasis on equity in resource management at local or community levels. That is, maintaining security of livelihoods for the indigenous population given the increase in global forces on local economies. In general, global forces encourage the production of export commodities instead of focusing on providing for local needs. A potential for conflict exists between government and local interests, as well as between self-sufficiency and commercial interests (Singh and Pandey 1996).

Adaptations to changing environmental conditions by local people can have a major impact on livelihood security. As such, employment of local and indigenous people in the different development options is an important factor contributing to livelihood security. From a policy standpoint, the aim must be to promote sustainable livelihoods by means of diversifying the economy. The concept of pluralities is important to a discussion on diversifying economies. Pluralities have been defined as the diversification of activities carried out by one household on and off their land in order to secure the household's economy and welfare (Hetland 1986). Therefore, a household engaged in a range of activities, thus receiving income from a number of sources through diversification, reduces its exposure to risk.

2.5 Measurement of Sustainable Communities

The debate regarding what might be a broadly accepted way of measuring, monitoring, and assessing progress to sustainable development has deep roots. The modern era of assessing progress began in the late 1940s when systems of national accounts and the annual calculation of gross domestic product were introduced. These measures were designed to allow national governments to track the flow of goods and services in the economy through a calculation of national income. In time, the ease with which the simple numbers could be communicated, their usage in many countries, and the appeal of comparative assessment led to the popularization of GDP/GNP as an indicator of the overall well-being of a nation (Daly and Cobb 1989).

Over the past century, some practitioners have spoken out against this practice (Daly and Cobb 1989; IISD 1999). In 1987, the World Commission on Environment and Development added its voice to the appeal for new ways of measuring progress that

would go beyond economic signals and capture a more complete sense of human and ecological well-being. This lay at the heart of the idea of sustainable development, and the recognition that a shift in the nature of human activities was required if life for future generations was to be sustained. In 1992 the Earth Summit in Rio de Janeiro, Brazil echoed this same message in Agenda 21 (Ekins 1993). Agenda 21 resulted in the development of numerous international, regional and national initiatives for sustainable development (DFO 1998a).

A full decade has passed since the WCED voiced its call for sustainable development. Communities, governments, businesses, international agencies, and non-governmental organizations are increasingly concerned with establishing a means to monitor performance and to assess progress toward sustainable development. As the new millennium approaches, individuals and organizations are taking account of current conditions, and considering future implications of present activities (Bossel 1999).

2.6 Obstacles and Supports

It is important to have a realistic appreciation of the difficulties involved in building a sustainable community. There are inherent problems in bringing together people with different interests and different views, and getting them to agree on and work towards shared goals (NMEDC 1993). Communities taking the road of sustainable development will find many obstacles along it, and it is wise to recognize and be prepared for them. Some of these obstacles include:

1. Lack of Understanding: Although the idea of sustainable development can no longer be considered new, it is still novel to many people. Difficulty in understanding the principle is often coupled with the suspicion and anxiety about the prospect of

departing from familiar, conventional ways, and with a fruitless desire to know what the new rules would be (Kretzmann and McKnight 1993).

2. Lack of financial resources: In times of fiscal restraints it is very likely that planners will be told that the respective community can't afford the program. But while a sustainable community action plan is unlikely to be completely cost-free, it has much less to do with spending "new money" than with rethinking the best use of the money that is already being spent. In some respects it may even result in spending less money (Kretzmann and McKnight 1993).
3. Inertia of the built environment: The physical fabric of a community – its buildings, streets, infrastructure does not change readily or quickly. But all of these elements do in fact change over time; all are replaced or renewed sooner or later. The sustainable community does not seek wholesale or radical overnight disruption of the built environment. It seeks only to ensure that as change takes place, it is assessed against sustainable development objectives and criteria and is carried out in a sustainable way (IISD 1999).
4. Inertia of the political and administrative environment: While the quest for community sustainability must be community-based, it cannot be completely independent of governmental structures and processes. These are complex and often cumbersome, with programs and annual budgets falling into mutually exclusive, unrelated compartments in a way that is poorly suited to support multifaceted, long term initiatives at the local level (Kretzmann and McKnight 1993).
6. Time horizons and conflicting interests: The path of sustainable development cannot evade the reality of conflicting interests arising to a great extent out of wide

differences in the time scales involved. The benefits of a sustainable community to be gained in the long run are not likely to compensate most people for the prospective loss of a job, a market or an election in the short run. Working to shape a sustainable community does not mean minimizing such issues, but of finding ways to address them effectively (Kretzmann and McKnight 1993).

2.7 Two Frameworks to Assess Sustainable Development in Churchill

Measurement, as an indispensable tool to make the concept of sustainable development operational, helps decision-makes and the public conceptualize objectives, evaluate alternatives, make policy choices, and adjust policies as well as objectives based on actual performance. One of the most popular methods of measuring sustainable development is the indicator framework. Sustainable development indicators are selected key statistics or parameters which, tracked over time, can represent or summarize trends in social, economic, and environmental conditions. Results of indicator programs to monitor community sustainability can be linked to community plans or vision statements, and can be used to monitor the effectiveness of public policy and programs in the community (SCIP 1999). This chapter reviews the applicability of one indicator framework for Churchill, Manitoba.

The backcasting method is a relatively new framework for evaluating sustainable development. Historically, backcasting has been used in the fields of ecology and climatology to monitor population trends and climate patterns. It can effectively make use of both qualitative community input and quantitative population and economic data. The backcasting framework has been used to measure sustainable development

successfully in a number of European and Canadian communities (Holmberg 1998; IISD 1999)

2.7.1 The Sustainable Community Indicators Program (SCIP)

In June of 1995, Environment Canada and Canada Mortgage and Housing Corporation (CMHC) sponsored the "Measuring Urban Sustainable Development: Canadian Indicators Workshop". At this workshop the invited indicator specialists recommended the development of a menu of core indicators and use guidelines, and a guide for municipalities. The guide was to be based on a single, yet flexible approach to the development of indicators for measuring progress towards sustainable development at the community level. Environment Canada and CMHC determined that the development of an interactive indicators software package that all municipalities could use would be the most effective way to satisfy these recommendations. In 1997, the partners began to develop a prototype software tool that enables municipalities to develop, compare and share their indicators. The following year, a group of volunteer municipalities and community groups tested this prototype. The results of the pilot testing provided the basis for the final design and implementation of the software (SCIP 1999). Thus far, the SCIP has been implemented effectively in several communities in Vancouver, southern Ontario and Alberta (SCIP 1999).

The overall objectives of the Sustainable Community Indicators Program are: to help communities select, create, and use indicators for monitoring local sustainable development; to promote the use of comparable indicators; and to encourage the sharing of indicators and data, both among municipalities and with other levels of government (SCIP 1999).

2.7.2 Backcasting with A Scenario

The term "scenario" is taken from the world of theatre and film, and refers to a brief synopsis of the plot of a play or movie. In a planning context, scenarios can be described most simply as "stories of possible futures that the community might encounter"(Wilson 1994 p. 3). Scenarios are graphic and dynamic, revealing the flow of an evolving future. Writing scenarios, or constructing pictures of the future (forecasting), is common within parts of science, although not so frequently used within the social sciences. Rather this methodology has been subject to criticism (Premfors 1989, Patton 1993). One reason for this is that that further one looks into the future, the more uncertainty increases. Such a critique is reasonable if the purpose of the scenario is to give a picture of the future given the information available today.

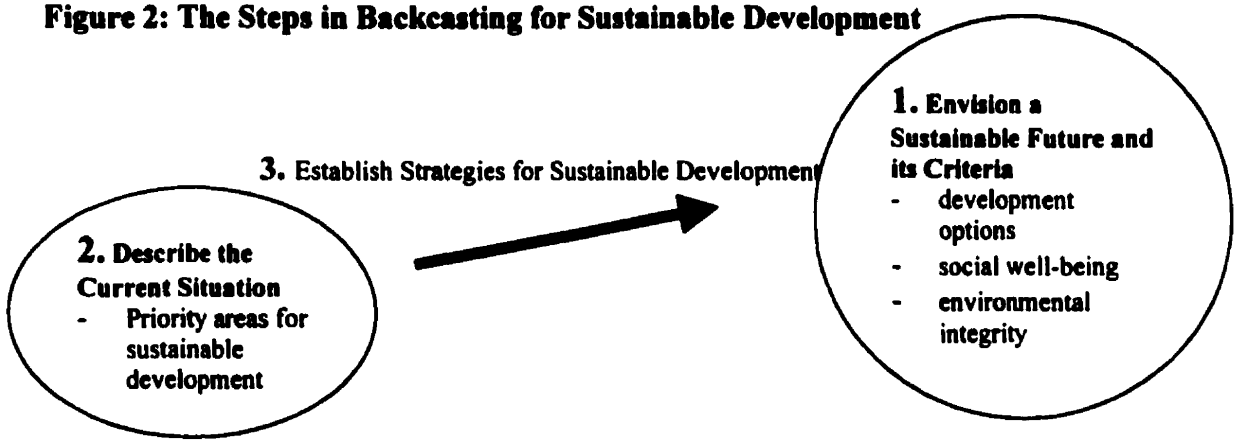
The kind of scenario proposed here, however, would be of a kind called "backcasting", which differs considerably from the points of departure being used in forecasting (Dreborg and Robinson 1996). In contrast to forecasting, backcasting starts by describing the goal. By comparing the picture of a sustainable future with current societal conditions, it is possible to say something about which societal adjustments such a future implies.

Figure 2 illustrates the different steps to be taken in applying the backcasting method. In the first step, the criteria for a future sustainable society are defined and discussed. In the next step, current activities and developments are inventoried and compared to these criteria. An important outcome of this step is the identification of areas of priority for sustainable development. Comparing and contrasting the inventory of the present situation in the second step with the criteria for a future sustainable

situation in the first step often provides useful information for the third step. In the third step, strategies are identified that can link the current situation with the future sustainability goal. In this step, it is important that strategies form a broad and flexible enough platform for the development of further activities (Holmberg 1998). Backcasting has proven to be a particularly useful when:

1. the community to be studied is complex;
2. there is a need for change;
3. dominant trends are part of the problem; and
4. the scope is wide enough and the time-horizon long enough to leave considerable room for deliberate choice (Dreborg and Robinson1996).

Figure 2: The Steps in Backcasting for Sustainable Development



2.8 Assessing the Relevance of the SCIP and Backcasting in Churchill

Several important benefits could be gained from the use of the SCIP in Churchill. The development of a community sustainable development indicators' program is normally a time-consuming and expensive task. The SCIP greatly facilitates implementing such a process by allowing communities to select, create and use indicators which have already been defined, for monitoring sustainable development (SCIP 1999).

The second benefit that may accrue from the use of the SCIP, is its user-friendly computer interface that allows users to browse or download indicators organized by issues, objectives, or local government functions. The presence of guidelines, existing protocols, and forms and templates also helps communities in the use of their own data. Another benefit of the SCIP is that it would guide users and provide suggestions for preparing a local vision of community sustainable development and in setting goals and objectives for achieving this vision.

There are also a number of drawbacks associated with the use of the SCIP in Churchill. The major problem with the SCIP in Churchill is the lack of long-term data that exist in terms of social, economic and environmental indicators. Long-term quantitative data are required with indicators in order to make substantial and valid conclusions about sustainable development (IISD 1999). This problem could be rectified in the future if the Town of Churchill identified a core set of indicators and focussed on collecting relevant data pertinent to those indicators. The second drawback of using the SCIP in Churchill is a lack of money. According to Cory Young (pers. comm. 1999), the Town of Churchill presently does not have the financial resources to collect data on sustainable development indicators. Due to the lack of quality indicator data associated with the SCIP, the researcher concluded that this approach would not presently be suitable for use in Churchill.

There are several benefits associated with the backcasting approach. It provides results that are holistic, combining social, environmental and economic trends and events (Holmberg and Carlsson 1999). It also enables the researcher to point out specific potential conflicts that may occur in the future. One of the objectives of this method is to

suggest suitable strategies to avoid those potential conflicts and provide a more sustainable future. Furthermore, the backcasting approach lends itself to long-term planning. The construction of a future scenario allows a community to better prepare for uncertainty, and to ensure that decisions are resilient and flexible (Mulder and Biesiot 1998).

The most powerful feature of backcasting is that it stretches the scope of a community's thinking, both about the future and, about sustainable strategies. The framework allows for community involvement in creating the scenario and developing strategies for its achievement. It can also provide a common vocabulary and an effective basis for communicating complex conditions and development options (Mulder and Biesiot 1998). Using scenarios is anticipating the future, and by recognizing the warning signs that are unfolding one can avoid surprises by, adapting, and acting effectively. Ultimately, the end result of the backcasting approach is not a more accurate picture of tomorrow, but better decisions today.

Although the backcasting approach can account for change at the community level, it does assume a "conventional worlds" scenario. The "conventional worlds" scenario assumes that the global system of the 21st century will evolve without major surprises, sharp discontinuities, or fundamental transformations (Ham 1997). Another one of the potential dangers associated with this approach is that the future scenario may be unrealistic. Therefore, it is important to involve community members and keep strategies realistic and plausible. The final potential drawback associated with this approach is that the researcher's perceptions and ideas may bias the future scenario. To minimize this

bias, this researcher incorporated the community members' perspectives into the development of the future scenario.

In conclusion, the backcasting framework is the most suitable for Churchill, Manitoba because it effectively incorporates community perspectives and offers realistic strategies for sustainable development. The SCIP could be implemented in the future if the community begins to gather indicator data on their environment, economy and social well-being.

2.9 Summary

Community sustainable development requires a new way of thinking about relations with other people, about employment, about the natural environment and the human needs it serves, about the future of children, and about the structure of communities at every scale. This new way of thinking stresses the need for cooperation in seeking common, fundamental goals for sustainable development.

Chapter 3

A Case Study of the History and Development of Churchill, Manitoba

3.0 Preamble

Churchill has a long and diverse history of development. This chapter will describe these developments, and examine how they have impacted the people, environment and economy of the Town. The chapter will also discuss Churchill's present development options as they relate to transportation, tourism, business, and social development.

3.1 History of Churchill, Manitoba

Prior to 800 BC the Pre-Dorset people inhabited the area that is now occupied by the Town of Churchill. Pre-Dorset people were forest and tundra dwellers who utilized the taiga as a hunting ground. They were replaced around 800 BC by the Dorset who evolved from the Pre-Dorset culture (Riewe et al. 1989). The major difference between the two societies was that the Dorset were more marine-oriented, hunting seals and walrus to supplement caribou kills, and living only in coastal areas (Beals 1968a).

The Thule people moved eastward from Alaska to replace the Dorset about 1000 AD. Evidence that these people lived in the area has been found in the Town of Churchill. It is from this culture that the modern Inuit evolved (Beals 1968b). All these populations were nomadic and returned seasonally to Churchill, indicating that the food supply of this particular area was of major importance to these people (Friesen 1992).

The first European to explore the Churchill area was Henry Hudson (1619-1620). However, it was not until 1670, when King Charles II of England granted sole rights of trade in land watered by rivers running into Hudson Bay, that a permanent fur trading post appeared on the western shores of Hudson Bay. The company built a trading post inland from the Churchill River mouth in 1689. In 1717, it was rebuilt and named Fort Churchill (Beals 1968).

As the French and English attempted to establish the fur trade with the northern Indians, a seesaw battle for supremacy on the Bay resulted. In 1713, the Treaty of Utrecht was signed, giving the Hudson Bay Company (HBC) control of the Bayside trade. Work began in 1717 to build a trading post at the mouth of the Churchill River. In 1730, the HBC decided to build a stone fortress as their main defensive post on the Bay. Prince of Wales' Fort would garrison men from other HBC trading posts in the event of a French attack on the company's coastal factories. Building the Fort was an ambitious undertaking and construction was not completed until 1771 (Dredge 1992).

Equal to the purpose of defense was the intention to use Prince of Wales' Fort as a base for Northern exploration and the search for valuable minerals. Prince of Wales' Fort never lived up to any of the HBC's expectations (Honderich 1984). Fur profits were not as great as anticipated, no major mineral discoveries were made and even a whaling venture proved unsuccessful. Interestingly, in 1782 the Fort fell to the French without a shot being fired.

In 1910 the Hudson Bay Railway began a line which was originally to terminate at Port Nelson, but due to better natural harbour conditions, the line was rerouted to Churchill. The line was completed in 1929 and the first grain shipment out was in 1931

after the completion of the grain elevators (Beals 1968). From 1956-1985 the Port of Churchill averaged 573,000 tonnes of grain per year, with the largest movement occurring in 1977 with 755,200 tonnes. However, since 1977 the annual amount of grain shipped through Churchill decreased.

During the 1950s and 1960s, the "Cold War" brought the American Army with their Distant Early Warning (DEW) Line facilities, to Churchill. As a result, the population of the town and the surrounding region increased to approximately 7,000 people. The presence of the Army in the town, generated economic growth and development. This settlement has since been dismantled, but the Army's rocket range facilities remain to the east of the town (Pelesh 1988). Plates 1 and 2 show the remains of two military buildings left in Churchill.

In 1956, federal government officials, concerned about a decline in caribou herds, blamed the Sayisi Dene (First Nations) for over hunting and decided to move them from their traditional land along the northern border of Manitoba to Churchill, on the shores of Hudson Bay (Dredge 1992). This action taken by the Canadian government would result in many negative impacts on the Sayisi Dene First Nation. Denied their traditional way of life, unable to speak English and left without jobs or support, the Sayisi Dene turned to alcohol and became mired in a destructive cycle of sexual abuse, domestic violence and suicide. As outsiders, they were shunned by the aboriginal people already in the area, and were settled away from the whites in the town, where all the services existed. Of the 300 people who were moved, 100 died in the next 20 years. It wasn't until 1973 that the survivors were finally moved to another Manitoba settlement southwest of Churchill, where they could return to their traditional way of life (Winnipeg Free Press October 5,

Plate 1: DEW line facilities for the US military in the 1950s and 60s, June 1999

Plate 2: Former US Navy building that still contains large amounts of asbestos, June 1999

1999). Plates 3 and 4 show the remains of the Dene Village and the Churchill cemetery where many of the Dene are buried.

In 1976 hydroelectric development occurred on the Nelson River, southwest of the Churchill River. The hydroelectric project diverted 75% of the Churchill River into the Nelson River (Dredge 1992). Prior to the diversion, the Churchill River boasted a healthy supply of arctic char, trout and other wildlife. Many of the Churchill residents would travel up and down the River to hunt and lodge in their cabins. However, after the diversion many of these activities were no longer possible.

3.2 Development Sectors in Churchill, Manitoba

This section examines the present day development sectors in Churchill, Manitoba. Development activities have been divided into four main categories: transportation (Hudson Bay Port Company, Northern Transportation Company Limited), tourism (wildlife, history), business (research range, small business), and social development (RHA Inc., education).

3.2.1 Transportation Sector (Sea, Air and Rail)

Transportation and tourism are the most important aspects of economic development in Churchill. The transportation sector in Churchill consists of the Hudson Bay Port Company, Northern Transportation Company Limited, Calm Air, and VIA and CN Rail. The Hudson Bay Port Company has experienced many growing pains in its 70-year history. Initially, there was great hope for the Hudson Bay project in its early days. As with the St. Lawrence Seaway facilities, the Churchill plan was conceived in the days of high volume exports of Canadian grain to Europe (Zeweniuk 1977). Optimism continued when radar, improvements in other navigational aids, and new technology for

Plate 3: Site of the former Dene Village on the outskirts of the Town of Churchill, Manitoba, June 1999

Plate 4: Grave sites of many of the Dene People on the Hudson Bay Coast, June 1999

forecasting and reporting on ice conditions took much of the hazard out of sailing into Hudson Bay from the Atlantic by way of the Davis Strait. But from a high water mark of 621,000 tonnes, exports through Churchill declined to an all-time low of 50,100 tonnes by 1988/89 (Zeweniuk 1977).

The utilization of the Port has been affected by both economic and physical factors including:

- Domestic and international marketing considerations;
- Relatively high marine cargo and hull insurance rates due to the short shipping season;
- The existing level of marine technology; and
- A railway line to the port that was built over discontinuous permafrost which required constant maintenance and precluded the use of the larger more efficient hopper cars (Canada Grains Council 1997).

The federal and provincial governments have played a major role in the transportation system's development since the early 1900s. Both governments were involved in the development of the region by actively supporting the building of the Hudson's Bay Railway. In later years, both the federal and provincial governments sought to stimulate economic growth in Churchill by constructing the Port of Churchill and supporting comprehensive federal/provincial development agreements.

The federal government has often been criticized for investing in infrastructure for Churchill's rail line and port. Expenditures on the Churchill rail line and port facilities have included:

- $31 million for branchline rehabilitation;

- $2.2 million for road bed stabilization;
- $0.3 million for testing of a prototype hopper car; and
- Port improvements since 1973 totaling $34.4 million (of which the Province paid $3.4 million) (Canada Grains Council 1997).

There have also been significant expenditures for the refurbishment of boxcars, which cost $35.4 million. The province and the federal government jointly shared this expenditure. Total annual subsidies for the Hudson Bay Rail line have been $42.6 million since 1982 (Arctic Bridge 1994). Table 2 shows the total amount of public monies invested by federal and provincial governments in Churchill since 1930. The actual costs of constructing the line are not included.

Table 2: Government Investment in Churchill, Manitoba since 1930 (Canada Grains Council 1997).

Type of Investment	Amount Invested ($ millions)
Branch Line Rehabilitation	$31 million
Road Bed Stabilization	$2.2 million
Subsidy-Operating 1982-1984	$8.4 million
WGTA Subsidy 1986 to 1995	$34.2 million
Port Improvements	$34.4 million
Boxcar Rehabilitation	$35.4 million
Prototype Hopper Car	$0.3 million
Total	$145.9 million

Due to the financial constraints of the Port, Transport Canada decided to sell the Port to a private company. The Port was finally transferred to the Hudson Bay Port

Company (HBPC), a subsidiary of OmniTRAX Canada Inc. in 1997 (Tinsdale 1997). Before the Port was transferred from public to private hands in 1997, several environmental measures and capital improvements had to be undertaken. Improvement projects at the Port included bulk materials handling, dust control system, hopper car conversion, sewage disposal system, marine tank farm upgrade, wharf repairs, dredging and other minor repairs. The cost of these improvements was approximately $100 million. Fifty-percent of these costs were absorbed by the federal government and the other fifty percent was paid by OmniTRAX Canada Inc (OmniTRAX 1998).

Today, the Port is important to Churchill as a Town because it employs approximately 100 local people. It is also important to Manitoba as the only central seaport in the province, and to the Northwest Territories as a re-supply base (OmniTRAX 1998). The Hudson Bay Port Co. is strategically located on the west coast of Hudson Bay. The Port offers four deep-sea berths for the loading and unloading of grain, general cargo, and tanker vessels (Norquay 1997). Close coordination with the Hudson Bay Railway, its sister company, allows efficient access to all North American points through a connection with the Canadian National Railway system (OmniTRAX 1998).

Table 3: Hudson Bay Port Company (OmniTRAX 1998)

Type of Facility	Characteristics of the Facility
Berths	Four deep sea berths, including one tanker birth
Vessel Size	Up to 57,000 DWT
Grain Elevator	Storage capacity – 5 million bushels.
Shipping Capacity	1,623 tonnes (60,000 bushels) per hour
Cleaning Capacity	850 tonnes (30,000 bushels) per hour
Petroleum Terminal	Storage for 50 million litres, plus rail and dockside distribution systems for various petroleum products, including gasoline, diesel, heating oil, aviation oil, and jet fuel.

The main goal of OmniTRAX Inc. is to improve the capacity and effectiveness of the Port. The Hudson Bay Port Co. presently handles only a small percentage of all of Canada's grain (MacAngus 1997). There is a strong impetus by OmniTRAX to have Churchill assume more grain tonnage over the next few years. Grain is the main commodity presently exported through the terminal at the Port of Churchill. The port facilities can handle in excess of 650,000 tonnes during the present 13-week shipping season based on a 10 hour, six-day week. The amount of grain being exported through Churchill could be increased to one million tonnes with the facility improvements (OmniTRAX 1998).

An important component of the transportation system is the Northern Transportation Company Limited (NTCL). NTCL is located at the Hudson Bay Port Co. and has served successfully as a distribution centre for the Central Arctic Region since 1975. Cargo is brought to Churchill by train and transferred by barge to the communities (NTCL 1999). This marine service was sold in late 1985 by the Government of Canada to the Nunasi Corporation (IBI 1986). Currently NTCL provides marine resupply to six communities on northwestern Hudson Bay (Duguid 1997). The traffic is presently 35,000 tonnes annually (9,000 tonnes dry products, 26,000 tonnes fuel). The resupply activity currently represents over $100 million of business to Manitoba (NTCL 1999).

Characteristics of the Port

With the elimination of the Western Grain Transportation Act (WGTA), farmers now pay the total cost of moving their grains, oilseeds and specialty crops to the export position. In the past, the WGTA has masked the true cost of moving commodities long distances (KGS Consulting 1998). The Hudson Bay Port Co. estimates that the total cost

of moving the grain for prairie farmers to Churchill is $25/tonne cheaper than sending it east or west. Therefore, if 1 million tonnes of grain were shipped through the Port, that would mean a $25 million saving to the prairie farmers (Alan Johnson pers. comm. July 1999). Using the Hudson Bay Port Company eliminates time-consuming navigation, additional handling, and high-cost transportation through the Great Lakes and St. Lawrence Seaway (Arctic Bridge 1994).

Churchill provides unique opportunities for the export of manufactured, mining and forest products, as well as the import of ores, minerals, steel, building materials, fertilizer, and petroleum products for distribution in Central and Western Canada. It is a vital link in the trans-shipment of petroleum products and goods of all kinds to the communities in the Hudson Bay region. The Arctic Bridge Report released by the province of Manitoba in December 1994, highlighted some opportunities for two-way trade with Russia. These opportunities were: phosphates for fertilizer processors in Alberta, Saskatchewan and Manitoba; copper and nickel to replace declining ore reserves in northern Manitoba; and forest products. The report identified potential imports of 315, 000 tonnes annually from Russia to Canada through Churchill. Two-way trade opportunities with other countries have yet to be established (Arctic Bridge 1994). See Figure 3 for Arctic Bridge trade routes.

The Port is available for shipping and receiving ocean vessels from July until early November. Earlier or later scheduling could be available by using ice-class vessels or icebreakers (Canadian Wheat Board 1999). However, with modern radar and up-to-date satellite information, and new sonar technology to aid ice-breaking, Churchill could be accessible for a longer season. Churchill has the added advantage that, unlike some

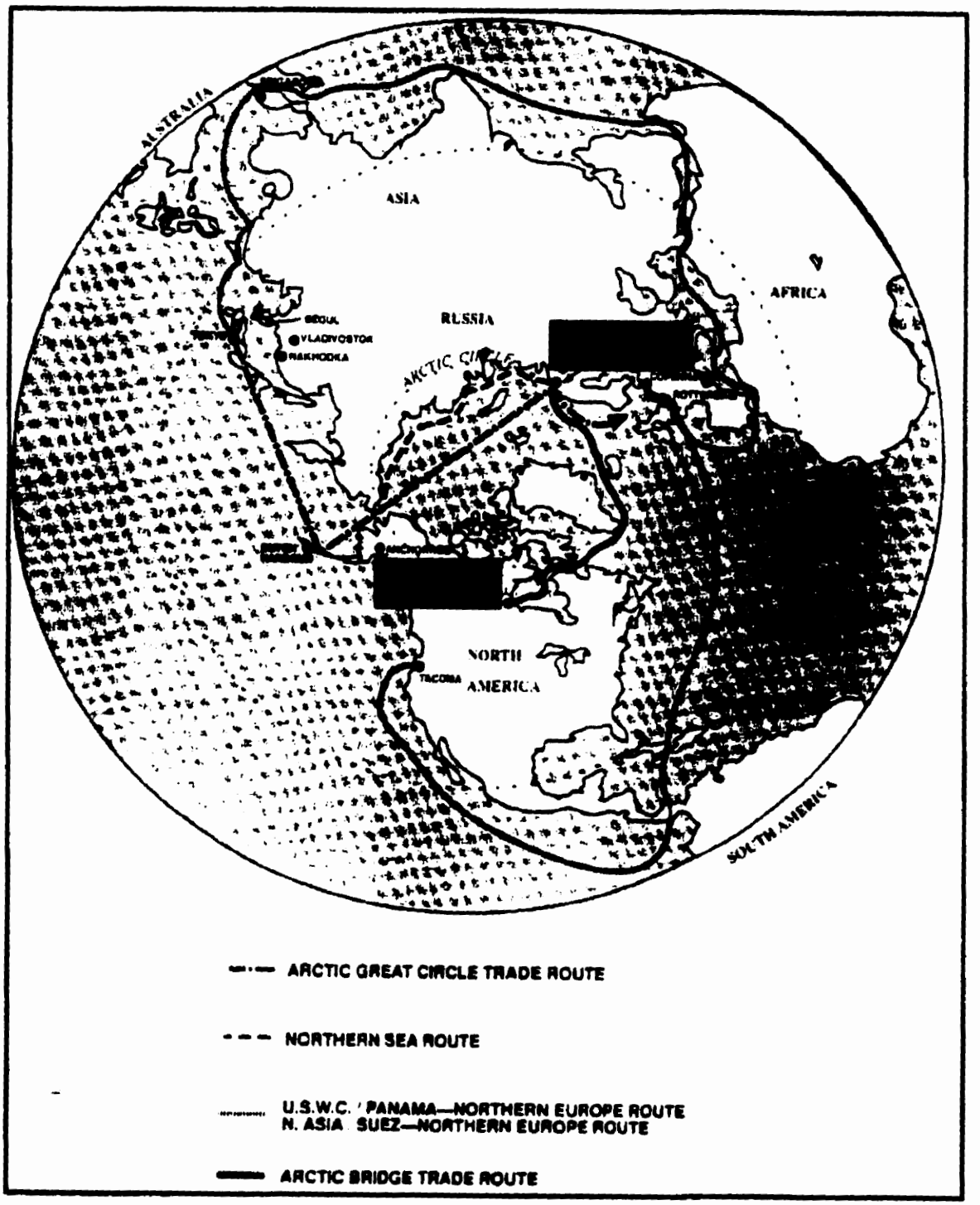


Figure 3: Arctic Bridge Trade Routes (Arctic Bridge 1994)

ports, it is able to handle all classes of ocean going vessels. Churchill is served by an all-weather airport that can accommodate very large aircraft. There are significant improvements to existing facilities now underway at the Port, and Hudson Bay Port Company will support investment, design and construction of additional facilities to meet new opportunities (OmniTRAX 1998).

Changes in the Shipping Environment

Several changes to the shipping environment have occurred since 1997, some of which have made the Hudson Bay Port Company more economical and desirable as a Port. The next section will examine the changes that have affected Churchill in policy governing shipping, logistical factors, and the international trade environment.

In the area of policy changes, prior to 1997 the Western Grain Transportation Act (WGTA) meant that the producer paid only a portion of the cost of shipping grain and realized little impact of a lower freight rate. The St. Lawrence pooling system also assumed that Thunder Bay and Vancouver were equivalent pricing points, which was not true. The price premium at St. Lawrence ports no longer offset the cost of the Seaway (Canada Grains Council 1997). Since 1997 the shipper is now required to pay the total cost of moving grain and therefore wants the least cost option to service a market. Another positive policy change since 1997 is that the St. Lawrence Seaway costs are now being reflected back to the producer (Canada Grains Council 1997).

The most recent proposed policy changes deal with competition involved in grain reform. In 1997, Justice Willard Estey proposed the removal of the 1995 government-imposed cap on grain freight rates (Estey 1998). He urged increased reliance on competition between railways to determine the freight rates and on grain companies to

direct traffic (Winnipeg Free Press October 12 1999). In 1999, the federal government appointed Arthur Kroeger, former deputy minister, to follow up on Estey's recommendations. The Kroeger report supported the Estey report and recommended overhauls to the country's grain transportation system, calling for an end to the direct hand the wheat board has had over moving Prairie grain to market for more than 60 years (Winnipeg Free Press October 7 1999). OmniTRAX Inc. is concerned that if the Wheat Board is not controlling the movement of grain to the port, it will be difficult to market Churchill (OmniTRAX 1998). It remains to be seen if these recommendations will be implemented, and what type of impact they will have on the Hudson Bay Port Company.

Many logistical factors have also changed to make the Hudson Bay Port Company more economically viable. Prior to 1997 the Port used inefficient boxcars with access to a declining number of elevator sites. There were very long turnaround times for the railway, and there was limited coordination and marketing of the rail and airport activities. Since 1997 the shift to aluminum hopper cars improved the car turnaround, allowed access to all elevators across the prairies and permitted movement of specialty crops. There was also a renewed willingness on the part of CN to be an active partner working with OmniTRAX for the system to succeed. This partnership allows coordination of the rail/port facilities to create the necessary synergy to achieve success (Canada Grains Council 1997).

Several changes also occurred in the international trade environment to make the Hudson Bay Port Company more economical. Prior to 1997, the world was moving towards increased globalization, but import duties and other restrictions limited trade. Since 1997 there have been lower import duties and more market opportunities. The

Canada/Chile Free Trade Agreement, along with the GATT and other trade agreements mean new opportunities for grain, oilseeds and specialty crops (Canada Grains Council 1997). Table 4 summarizes the changes in the shipping environment.

Table 4: Changes in the Shipping Environment (Canada Grains Council 1997)

	Pre-1996	Post-1996
Logistical Factors		
Hopper Cars	-boxcars only -29 day turnaround	-aluminum hopper cars -access to more prairie points -more efficient loading/unloading
CN Cooperation	-Limited enthusiasm	-willingness to work with OmniTRAX
Integrated System	-lack of coordination -lack of marketing	-coordinated activity synergy -focal point for marketing improves system break-even
Competition and Grain Reform	-government imposed rate cap on grain freight rates	-Estey and Kroeger recommends removal of rate cap (Pending).
Policy Changes		
WGTA	-pay only portion of the cost of shipping the product	-pay full cost of rail -farmers recognize the savings using Churchill
Pooling Seaway	-mask most of Seaway cost	-larger portion paid
International Trade Environment		
Globalization	-import duties/trade restrictions	-free markets, new opportunities -CWB selling more grain priced at buyer's port -sufficient crops to service Northern Europe and Latin America

3.2.2 Industry Development Sector

During World War II, Churchill was important as part of the North America-Great Britain aircraft ferry routes. Fort Churchill was established five miles from the

Plate 5: The Churchill Research Range, former site of Akjuit Aerospace Inc. in Churchill, Manitoba June 1999

Plate 6: The Hudson Bay Port Company, owned by OmniTRAX Inc. in Churchill, Manitoba, June 1999

Town by the United States Army as a Strategic Air Command Base. Fort Churchill was later used as an Arctic training site by the Canadian Armed Forces. In 1957, a rocket research range was established within what is now the Cape Churchill Wildlife Management Area (Beals 1968b). At this time 1000 troops were being trained, with 443 military and 338 civilian personal running the program (Newbury 1992).

Canadian military operations were cancelled in 1963, although the American forces continued to use the fort until 1975. Since then the base has been under the direction of the National Research Council and used for atmospheric investigations (Dredge 1992). The last rockets were shipped to Sweden in June 1986, although satellites are still being tracked from the site. Part of the launch site is now the home of the Churchill Northern Studies Centre, which serves the needs of various scientists and researchers from across the world.

Churchill is ideally suited to polar launches and has advantages no other location in the world can offer. There were more launches from Churchill (3,500 from 1958 to 1985) than from any other site in the world. The range provides more potential launch days than any other competitors because it avoids populated areas in the flight path. For this reason, flight adjustments after launch are not required, thereby saving on fuel and increasing payload capacity (SpacePort 1994).

In September 1993, Akjuit Aerospace Incorporated applied for and received an option to lease the Churchill Research Range from the Manitoba government. Akjuit then proceeded to conduct an extensive environmental assessment of the proposed "SpacePort", which focused on ecological impact, public opinion and potential markets. After the assessment was completed, Akjuit exercised its option on the range on July 18,

1994, and signed a renewable 30-year lease with the Province of Manitoba (SpacePort 1994). SpacePort Canada was marketed as the first international polar commercial spaceport. It was also to be the largest privately funded project in Manitoba's history.

The launch facilities constructed by Akjuit attempted to incorporate shifting technology for satellite applications. The SpacePort Canada project would have provided a site to launch large networks of small satellites travelling in a polar orbit 400 miles above the earth. Uses of this type of network include a second-generation global cellular telephone system, navigation and remote sensing, as well as other communication systems (SpacePort 1994). Due to financial constraints and lack of technological advancements Akjuit was forced to foreclose. One community member in Churchill stated that major players in the Aerospace industry were reluctant to have their rockets fired from a small remote Canadian town (Anonymous pers. comm. July 1999). As a result of the foreclosure of Akjuit, many investors from the Town of Churchill lost money. Today, resentment and distrust surround the future possibilities associated with the Churchill research range (Anonymous pers. comm. June 1999). However, as of July 1999, the Town of Churchill is still in negotiations with prospective owners in an attempt to revive the research range (Town of Churchill 1999).

3.2.3 Tourism Development Sector

Polar regions have attracted a growing number of visitors over the past two decades. This trend will likely continue as the demand for wilderness experience increases and travel costs decline (RHA 1999). Although tourism can provide much needed income to northern communities, it can also lead to negative impacts such as pollution, habitat modification, diminished wildlife and cultural deterioration. Tourism

in Churchill is no exception, with the support of local business, it has become an important source of livelihood, particularly in the last 20 years. Tourism is growing very rapidly, approximately 5 percent per year (Canada Grains Council 1997). Specific concerns associated with tourism growth in Churchill include environmental impacts due to all-terrain vehicles, particularly large commercial ones. Changes in animal behaviour patterns, particularly in polar bears, due to chasing, baiting and feeding by tourists, are another concern (DNR 1999). There are also concerns about the impact of human intrusion on bird nesting areas during the incubation period. The impact of tourists on northern local residents and aboriginal culture is another concern associated with the growth of tourism in Churchill (DNR 1999).

The attractions of the Churchill area range from wildlife and scenery to history and festivals. The wildlife of Churchill has already been discussed in Chapter I. The variety of scenery is spectacular, characterized by rugged shorelines, tidal marshes, tundra, and low scrub forests (Fleming 1988). The history of Churchill has been long and varied, as suggested earlier in this chapter. Much of this history is available to the tourist through presentations and tours. Attractions include the Eskimo Museum, Fort Prince of Wales, Sloop's Cove, Button Bay, Cape Merry, the wreck of the Ithaca and the rocket range. The main tourist seasons are shown in Figure 5:

Table 5: Main Tourist Seasons in Churchill, Manitoba

Season	Activity
Spring Late May to June	Bird Watching: Bird watching is best during the spring migration and nesting periods.
Summer Late June to Early September	Beluga Whales: Whale watching requires open water and safe conditions for boating.
Fall September to Mid-October	Hunting: Goose hunting season corresponds with the early fall.
Winter October to Early November	Polar Bears: Polar bears are most visibly evident during these months when they migrate to the coastal areas to await freeze up of the pack ice on the Bay.

Tourism and travel account for approximately 40% of the local jobs. In 1996, about 12,000 visitors flew to Churchill, while an additional 6,500 arrived by rail. The estimated direct impact on the Churchill economy for that year was $6.5 million (LGD 1996). In 1999, it is estimated that 18,000 to 20,000 visitors traveled to Churchill (Helen Fast pers. comm. November 1999).

A study by the Arctic Bridge Task Force showed that more tourists would visit the Town during the summer and fall seasons if accommodations were not limited (Arctic Bridge 1994). Although there have been a number of hotels built in the last 3 years, there is still an existing need for further accommodations. Future development in this area could take a number of different forms including a hotel-motel, remote lodge and guest houses (Town of Churchill 1999).

Currently, some ocean cruise line operators offer tours that include Churchill as a port of call. Government representatives from the Russian Arctic Bridge Task Force indicated an interest in encouraging circumpolar cruises between Churchill and Murmansk as well as other ports in the Russian North. The ocean cruise tourists arriving at Churchill via the Port could take the train/road south, venture into Manitoba's

northlands and visit a number of communities, some of which are aboriginal (Gateway North 1995). In 1999, four cruise ships visited Churchill, each carrying approximately 200 tourists (Helen Fast pers. comm. November 1999).

Churchill plays an important role not only as a destination in itself, but also as a staging area and "gateway" to the Arctic. At the present time, there is a growing awareness of the relatively undeveloped tourism potential in the adjacent regions including the Arctic. As a result, there are a number of major tourism development initiatives being undertaken in these regions that will have significant implications for Churchill. The Nunavut region to the north of Churchill is presently undertaking a major tourism initiative. In each of the Nunavut communities, a number of development opportunities were identified to capitalize on the most promising specialty markets. The major specialty market segments identified for Nunavut include:

- sport fishing market;
- sport hunting market;
- remote naturalist lodge market;
- adventure travel market;
- photographic safari market; and
- arts and culture market.

Churchill is an excellent position to capitalize on the tourism initiatives being undertaken in Nunavut because of its strategic "gateway" location. Clearly this will have a significant influence on transportation initiatives considered for Churchill.

The Wapusk National Park is another tourism sector that may increase opportunities for the Town. Situated southeast of Churchill, Wapusk National Park is

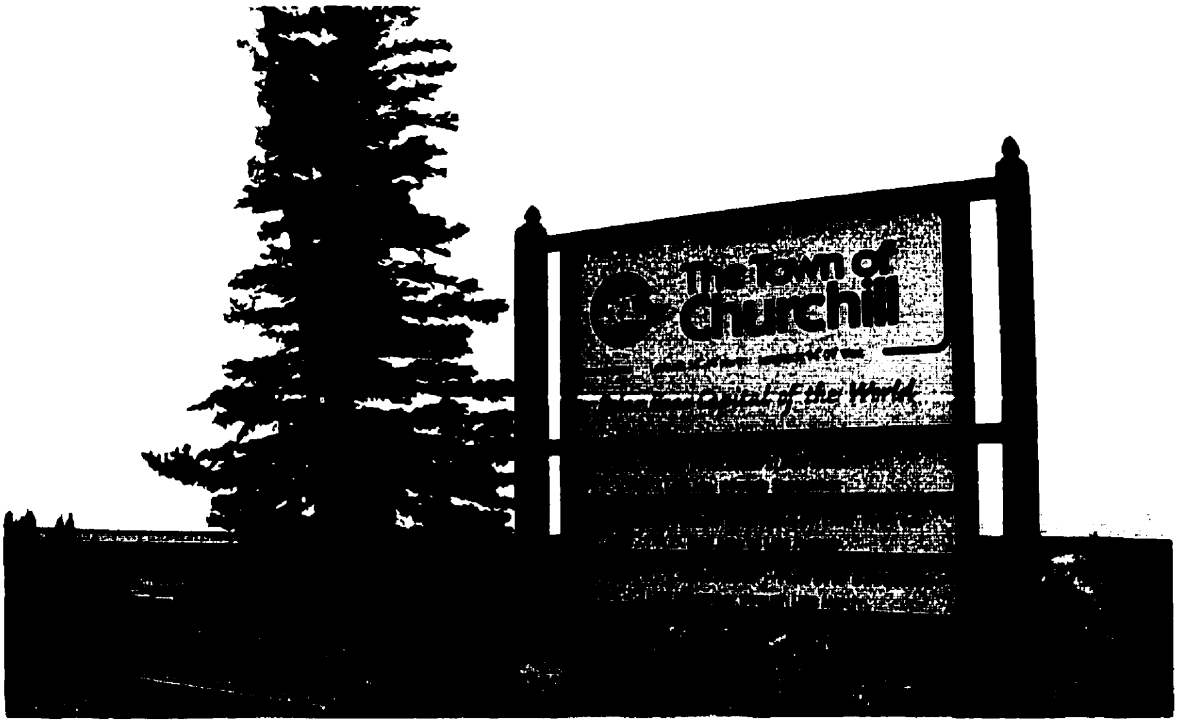


Plate 7: New sign in Churchill, Manitoba showing the wide range of tourism activities, June 1999

Plate 8: Tundra vehicle and transportable hotel in Churchill, Manitoba, June 1999

Plate 9: New log hotel being built on Kelsey Blvd. in Churchill, Manitoba, June 1999

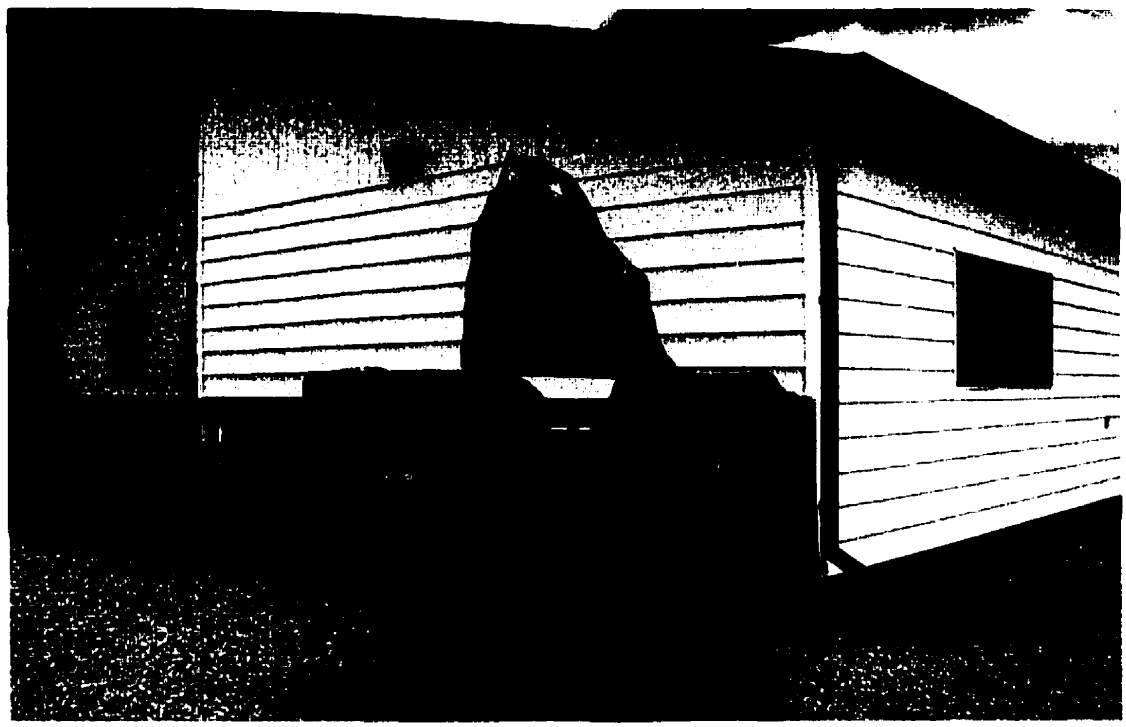


Plate 10: Inukshuk at the front of a recently renovated hotel in Churchill, Manitoba, June 1999

Canada's seventh largest at 11, 475 square kilometres. Wapusk is the Cree word for "white bear." The park includes one of the largest known polar bear denning areas. The park area is an excellent representation of the geology, physiography, vegetation and wildlife of the Hudson Bay Lowlands Nature Region. This nature region, which includes flat inland expanses of tundra, eskers and permafrost, is currently underrepresented in the National Park system.

Wapusk is the result of a successful partnership involving four groups: the Government of Canada; the Government of Manitoba; The Town of Churchill; and the First Nations of Fox Lake and York Factory (represented by Manitoba Keewatinowi Okimakanak (MKO), a political body for northern Cree). A management board is currently in place in the park. The park could contribute to northern Manitoba's economic future through job creation and growth in tourism (Turenne 1996).

3.2.4 Social Development Sector

The Churchill Health Centre opened on October 5, 1975, and evolved from the military's Fort Churchill Hospital located in Fort Churchill. It was built as part of a Federal/Provincial Government agreement to develop the town site of Churchill. The main priority was to set up a health care system that would meet the needs of the community and the Keewatin District of Nunavut. Churchill is strategically located in the middle of a north/south air corridor, 1000 km south of Repulse Bay and 1000 km north of Winnipeg. The Churchill Health Centre was recently regionalized and now is called the Churchill Regional Health Authority (RHA). The RHA offers the following services:

- Stabilization of the critically ill in preparation for their transport to the larger hospitals in Winnipeg;
- A well-equipped operating room and recovery room;
- A variety of advanced treatment programs, such as Ultrasound;
- Educational opportunities for students in health care related professions; and
- A fully equipped delivery room, which has a relaxed atmosphere for the mother and new baby (Churchill Health Centre 1998).

Churchill's Health Centre serves 6,000 people from Churchill, and eight surrounding Nunavut communities. The Nunavut communities served are Arviat, Whale Cove, Rankin Inlet, Chesterfield Inlet, Baker Lake, Coral Harbour, Repulse Bay, and Sanikiluaq. Almost 70 percent of the patients are Inuit from the Nunavut region. To provide accommodation for the northerners who come to Churchill for medical attention, there is a twenty-six bed transient centre serving the Nunavut region (Churchill Health Centre 1998).

The Health Centre is designed for outreach preventive care, social development and clinical activities. It has a thirty-one bed hospital with six beds designated for long term care. The hospital is equipped with an operating room, x-ray and emergency facilities. Ambulance service is also available. The northern medical unit of the University of Manitoba provides resident doctors, visiting specialists and dentists. Specialists' visits include: ear nose throat, orthopedics, plastic surgery, internal medicine, psychiatry, general surgery, gynecology, psychogeriatrics, radiology and pediatrics. An income-security advisor and an optometrist also visit Churchill Health Centre regularly (Churchill Health Centre 1999).

Churchill is equipped with modern schools offering programs for children in kindergarten through grade twelve. The Duke of Marlborough High School is equipped to provide distance education through the use of satellite dishes. It has nine classrooms and special areas for science, home economics, business education, fine arts, media arts, a resource centre and the community library.

Keewatin Community College provides post secondary and technical training on many subjects in Churchill and at campuses across Manitoba. Beside academic courses, students are encouraged to participate in extra curricular activities like music, carpentry and sports. Keewatin Community College is taking a lead role in providing work-related training by adding more courses to the existing curriculum. Courses like First Aid training, CPR training, and computer training have been big successes. The college also organized an extensive three-month long small motor repair course at the machine shop of the port. The college is now exploring a program for skills training for people to be employed at the research range. There are ample opportunities for training at facilities like the port's machine shop (Keewatin Community College 1999).

In conclusion, the Town of Churchill has excellent social development facilities in comparison with other remote northern Canadian communities. However, there are still a number of concerns associated with the delivery and effectiveness of these services in the community. Doctors and nurses working at the Churchill RHA usually stay for only 2 years in the community before moving on to another destination (RHA 1999). The RHA is concerned that these short work terms are detrimental because they do not allow patients sufficient time to establish trust for their health care providers. The education system on the other hand has a very poor record of graduating local students. The

community needs assessment that was performed by the RHA in 1997 stated that the current school curriculum is not adequately suited to needs of the children, in terms of aboriginal culture and local employment (RHA 1999).

3.3 Summary

The community of Churchill has supported a wide variety of developments, ranging from rocket research to tourism. These developments are due in part to Churchill's unique environment, strategic location and diverse wildlife. The positive and negative impacts of these developments will have implications for sustainable development of the community. As Churchill develops it is facing many changes, which to some degree are being shaped by the third party interests in response to the reduction, transfer or conclusion of federal government responsibilities towards Churchill. The increase in the interests of private groups in acquiring and managing certain government infrastructures and assets has influenced this change. How well Churchill can direct and influence these changes and move toward sustainable development will depend both upon the town's understanding of the interests involved and their commitment to local initiatives.

Chapter 4

Results and Analysis of Community Perspectives

4.0 Preamble

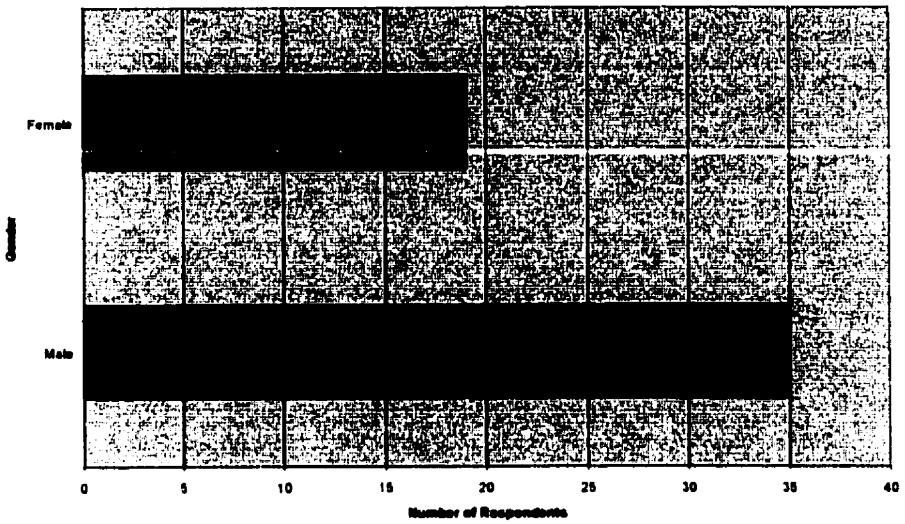
The purpose of this chapter is to present and analyze the results of the interviews conducted with Churchill residents. The interviews provided information about the demographic profile of the respondents, and highlighted the respondents' views of and attitudes toward their environment, social well-being and economy. This information will be used in the next chapter to underpin a future scenario of sustainable development. Fifty-four local stakeholders were interviewed in Churchill between May 10th and September 7th, 1999. The interviews were conducted face-to-face and in an unstructured manner, and key stakeholders were asked open-ended questions. Open-ended questions allowed respondents to talk freely about past and present experiences regarding the social, economic and environmental aspects of Churchill. Depending on the respondent's preference, interviews were either tape-recorded or hand-written.

4.1 Profile of the Respondents

The highest number of respondents in Churchill were male (Figure 4) and age 36 or older (Figure 5). In comparison to statistics for the entire community, males (n= 555) and individuals between the ages of 25-54 (n=540) also constitute the largest sectors of the community (Census Canada 1996). There was a higher proportion of non-aboriginal respondents (Figure 6). Census Canada statistics (1996) reveal that aborginals comprise approximately 50% of the entire community. The respondents' years of residence in Churchill (Figure 7) revealed that half of them have lived there for at least ten years,

however, a significant minority arrived within the last five years. The high number of new residents is due in part to the relatively high rate of turnover within the health care

Figure 4: Gender of the Respondents



and educational professions. Figure 8 shows the employment status of the respondents. Of the fifty-four individuals interviewed, only four were unemployed. Census Canada statistics (1996) show that the community as a whole has approximately 200 unemployed individuals. The highest number of respondents (n=16) were employed in the tourism sector (Figure 9). Government constituted the next largest employment sector of the respondents (n=12). The service sector and industry ranked 3rd and 4th in terms of the respondents' employment sector at (n=9) and (n=7) respectively. Fewer respondents were employed in research (n=3), health (n=1), education (n=1), and church (n=1). Statistics for the entire community show tourism employs approximately (40%) of the community (Canada Grains Council 1997). The Hudson Bay Port Company, Regional Health Authority and Town of Churchill constitute the next largest employment sectors for the entire community (Town of Churchill 1999).

Figure 5: Respondents' Age Groups

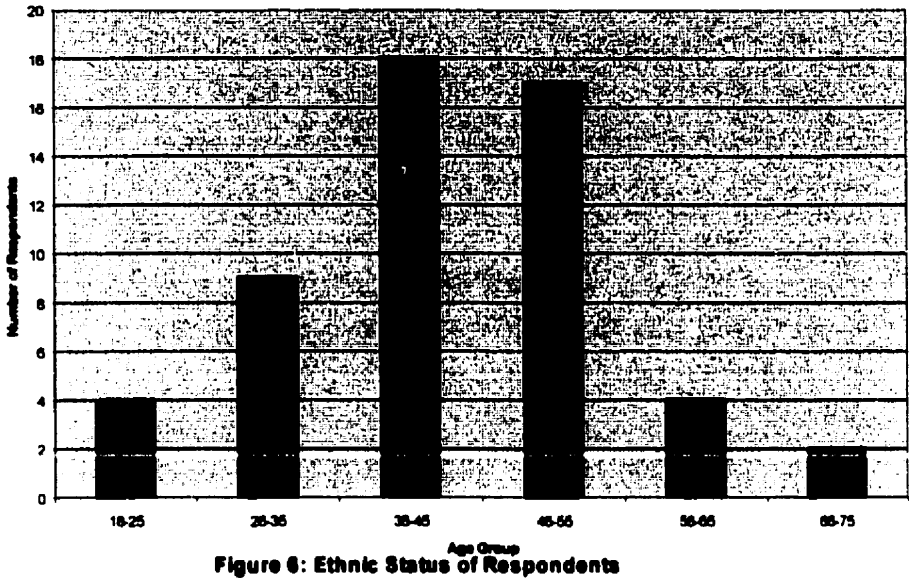


Figure 6: Ethnic Status of Respondents

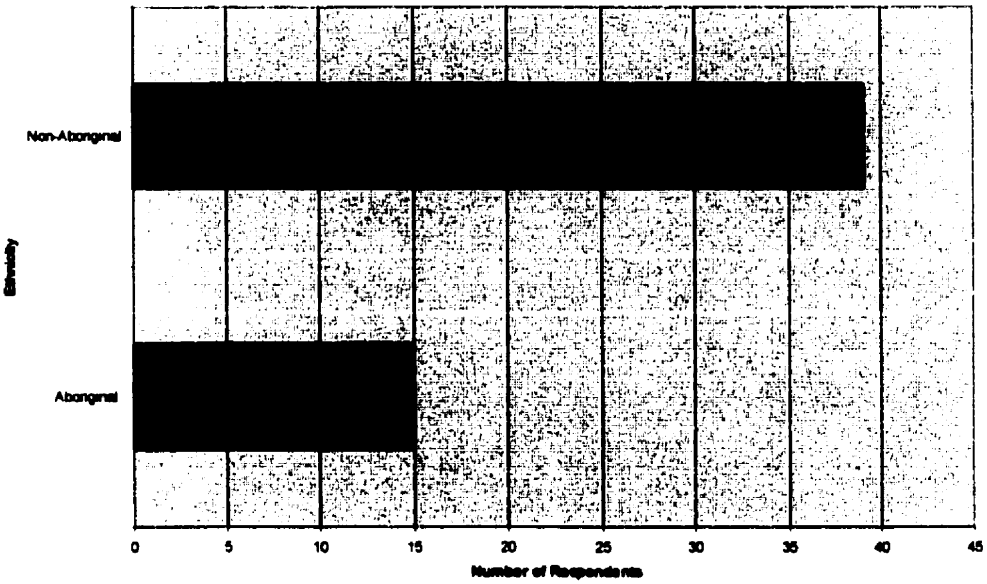


Figure 7: Respondents' Years of Residence in Churchill

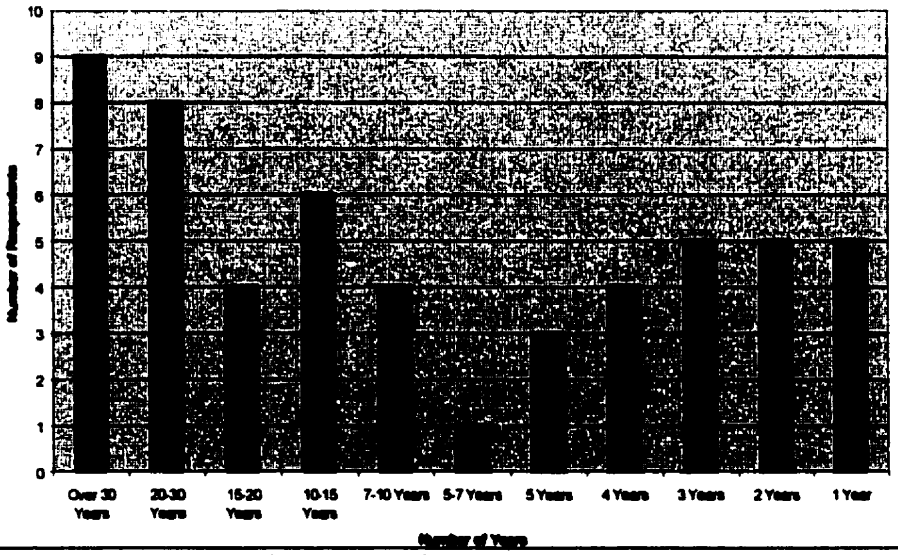


Figure 8: Employment Status of Respondents

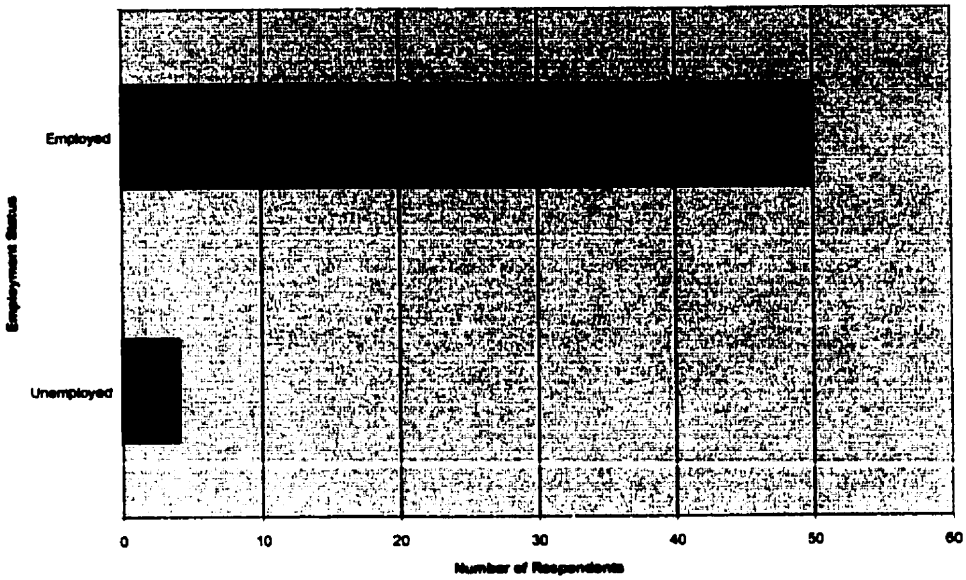


Figure 9: Respondents' Sector of Employment

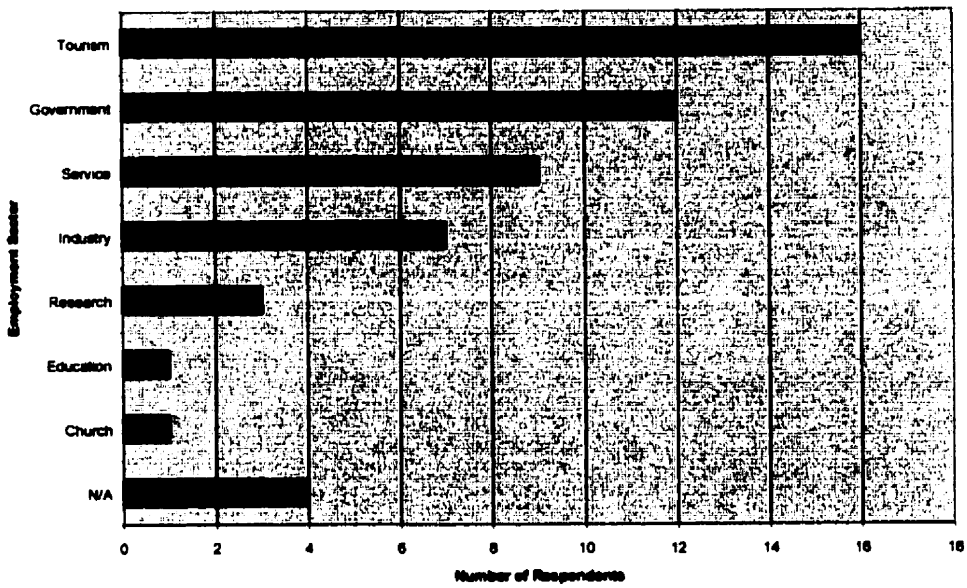


Figure 10: Number of Jobs Held in One Year

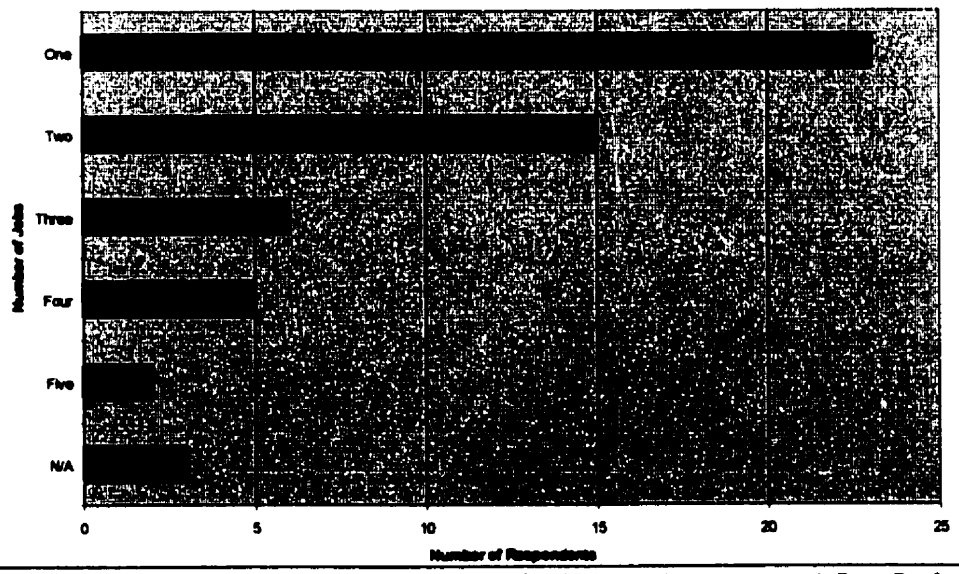
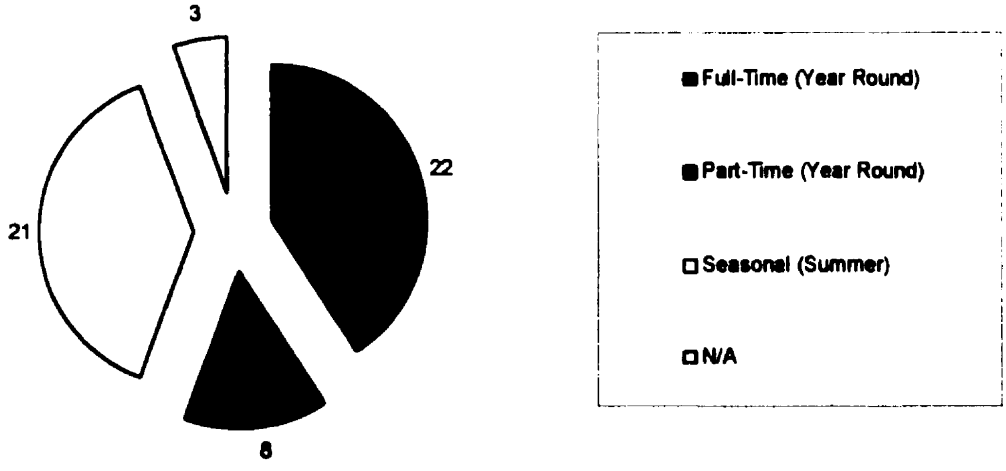


Figure 10 shows the number of jobs that the respondents held in one year. The highest number of respondents held only one job (n=23) annually, however a significant portion were employed in more than two positions annually (n=15). Six respondents stated that they were involved in three jobs annually. Fewer respondents confirmed that they worked four (n=5) or five (n=2) jobs annually. In many cases, Churchill residents are forced to work several jobs in the course of a year, due to the short seasonal nature of the tourism and shipping industries (Anonymous pers. comm. June 1999).

Figure 11 illustrates the employment terms of the respondents. The majority of the employment positions are split between full-time (n=22) and seasonal (n=21). Fewer respondents identified their employment terms as part-time (n=8).

Figure 11: Employment Term of Respondents



4.2 Environmental Aspects of Churchill

Previous development activities, such as the Churchill River diversion and the military activities of the 1950s and 60s negatively impacted the environment of Churchill (Dredge 1992). Today, there are a number of prevalent environmental issues in the Town, such as global warming, tundra vehicles, and others that may have further impacts

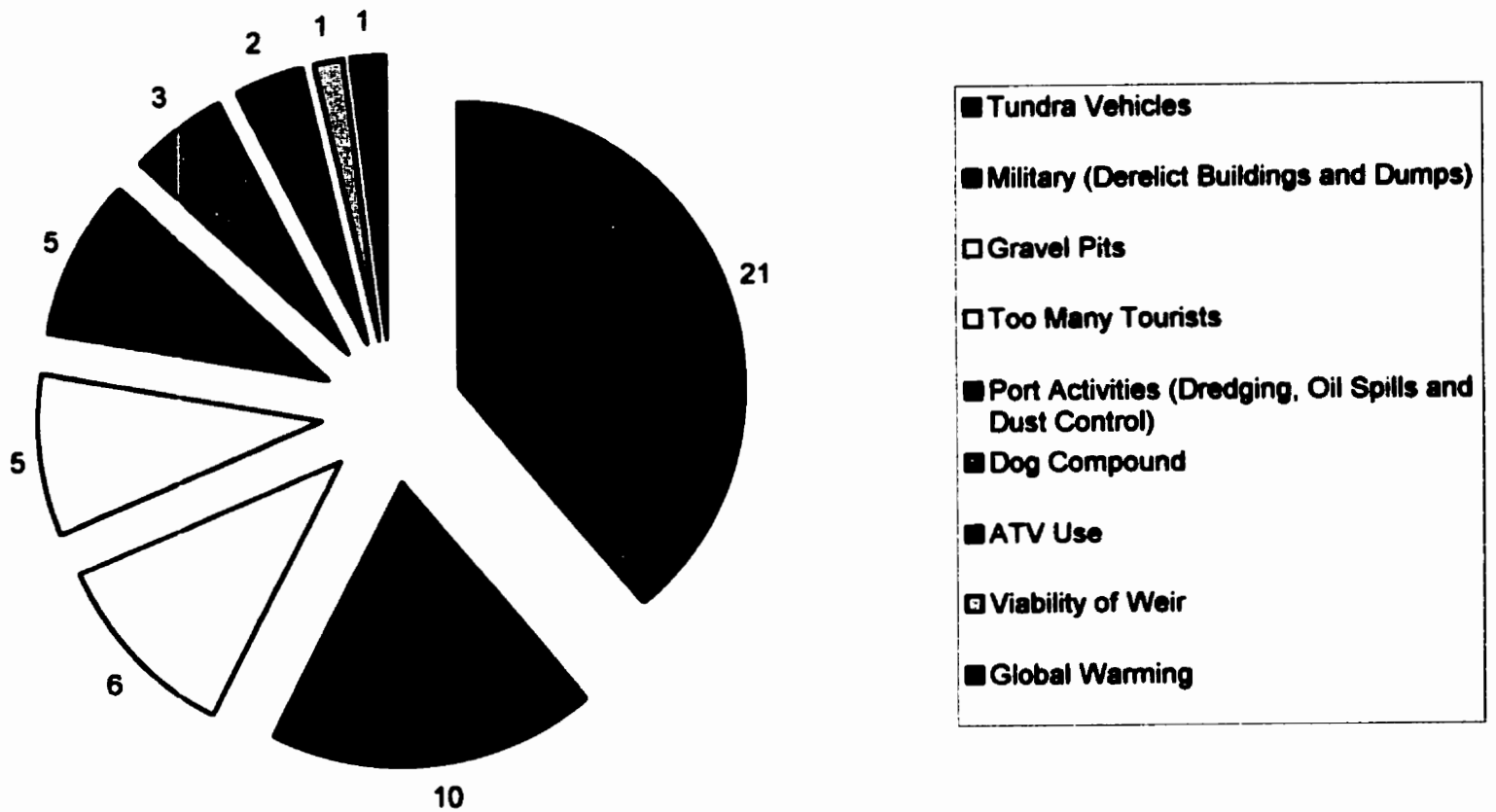
on this fragile ecosystem. This section identifies the community's main environmental concerns and recommendations.

4.2.1 Environmental Concerns

Figure 12 shows the community respondents' main environmental concerns. The highest number (n=21) of the respondents identified tundra vehicle damage as their main environmental concern in Churchill. According to one respondent, tundra vehicle damage stems from the introduction of these tractor-like machines onto relatively pristine tracts of land (Anonymous pers. comm. July 1999). Northern regions are very sensitive to damage caused by this human activity due to their generally severe climatic conditions and low biological diversity and productivity. This is particularly true for Churchill because of its permafrost-bearing soil (Webb 1985). As a consequence of these vehicles operating in the Churchill Wildlife Management Area, changes to soil configuration and vegetative communities have occurred (DNR 1999). Pre-existing military trails are supposed to absorb the tundra vehicle traffic, however, many of the vehicles venture away from these areas (Anonymous pers. comm. June 1999).

The second largest concern (n=10) in the community is the presence of derelict buildings and dumps left by the military in the 1950s and 60s. One respondent identified the presence of military contaminants and unsightly buildings as an eyesore and potential pollutant (Anonymous pers. comm. July 1999). Asbestos was used in the construction of many of these military structures, and PCB's have been found in the abandoned military dumps (Dredge 1992). The community is concerned that not only will the unsightly buildings discourage tourists, but that pollutants may cause problems for the surrounding wildlife. The federal government has sponsored an initial clean up of some of the sites,

Figure 12: Main Environmental Concerns in Churchill



however, many of the dumps and buildings still remain (Cory Young pers. comm. June 1999).

Next to tundra vehicles and former military operations, the existence of gravel pits along the Hudson Bay coast was the third main environmental concern (n=6). Many gravel pits along the coast were created in the 1950s and 60s to supply the military installations with gravel for construction. When the usefulness of the gravel pits was exhausted, the pits were abandoned (Pelesh 1988). Today, new gravel pits have been created along the Hudson Bay coast to supply construction workers with material for road and runway construction. One community respondent stated that the presence and expansion of these gravel pits may cause erosion and loss of wildlife habitat along Churchill's coast (Anonymous pers. comm. July 1999). One of the problems facing the community is that reclamation of these pits is very expensive and labour intensive (Dredge 1992).

A smaller number of the respondents (n=5) identified "too many tourists" as their main environmental concern. This concern relates to the carrying capacity of the Churchill environment. During the months of October and November 1999, approximately 10,000 tourists visited Churchill to view the polar bears (Cory Young pers. comm. June 1999). Community members are concerned that this level of population growth in such a short time may compromise both the environmental integrity and infrastructure of the Town (Anonymous pers. comm. June 1999). The same number of respondents (n=5) identified Port activities as their main environmental concern. The concern regarding port activities relates to the environmental impacts of dredging, oil spills and dust control. In the past, dust has been a problem within the community,

however, OmniTRAX's new dust control facility is supposed to eliminate this problem (OmniTRAX 1999). The impact of dredging on the marine environment is also a concern. Community members are worried that the alteration of the marine ecosystem may have negative impacts on the beluga whales in the Churchill River estuary. One oil spill associated with Port activities has occurred in the past (DNR 1999), Churchill residents are concerned about the potential for another (Anonymous pers. comm. July 1999).

Fewer respondents (n=3) mentioned the dog compound as their main environmental concern. The dog compound is an area along Churchill's coast where sled dogs are kept and fed. One respondent commented that the interaction of the polar bears with the sled dogs may cause habituation and safety concerns for both the dogs and bears (Anonymous pers. comm. July 1999). Fewer stakeholders felt that all terrain vehicle (ATV) use, viability of the Churchill Weir, and global warming were main environmental concerns at n=2, n=1 and n=1 respectively.

4.2.2 Global Warming

The Churchill region has been designated as a site that is very susceptible to climate warming (Stirling et al 1999). It is seen as an area of high biodiversity that needs to be protected and preserved (Gough 1998). Temperatures in western Hudson Bay have been steadily rising 0.3 to 0.4 of a degree every decade since 1950 (Stirling et al. 1999, CBC 1999a). The result in 1999 was that vegetation bloomed a month early and then died in the drought. As for the ice, satellite photos from the Canadian Ice Service show that the warming trend is steadily reducing the number of ice days in the bay (Stirling et al. 1999, CBC 1999b).

Some scientists feel that Churchill will be adversely affected by global warming (Stirling et al. 1999, Etkin 1991, CBC 1999a). One of those scientists, Ian Stirling, has found that the prolonged ice-free period caused by the warming will increase nutritional stress on the population of polar bears and reduce their survival rates (Stirling and Derocher 1993). These findings prompted the researcher to ask the community whether or not climate change was a concern to them (Figure 13). The majority (n=30) of stakeholders felt that climate change was not a concern. These findings would seem to suggest that Churchill residents are not convinced that global warming will have a negative impact on their community. For example, one respondent stated that warming would help to extend the shipping and tourism seasons (Anonymous pers. comm. July 1999). Eighteen respondents did feel it was a concern, and six were undecided.

4.2.3 Community Recommendations for a Sustainable Environment

The development of a successful strategic work plan for sustainable development involves the input of community members. Therefore, respondents were asked to make a recommendation that could improve the environmental health of their Town (Figure 14). Twelve people stated that placing and enforcing restrictions and regulations on tundra vehicles would improve the environment in Churchill. The reclamation of gravel pits ranked second among respondents (n=10) for a sustainable environment. One respondent suggested that reclaiming the gravel pits would stabilize Churchill's coastline and provide a healthier habitat for wildlife (Anonymous pers. comm. July 1999). Six respondents stated that the establishment of a tourism operational organization would improve the environmental health of the Town. A tourism operational organization for

Figure 13: Is Climate Change a Concern for Churchill?

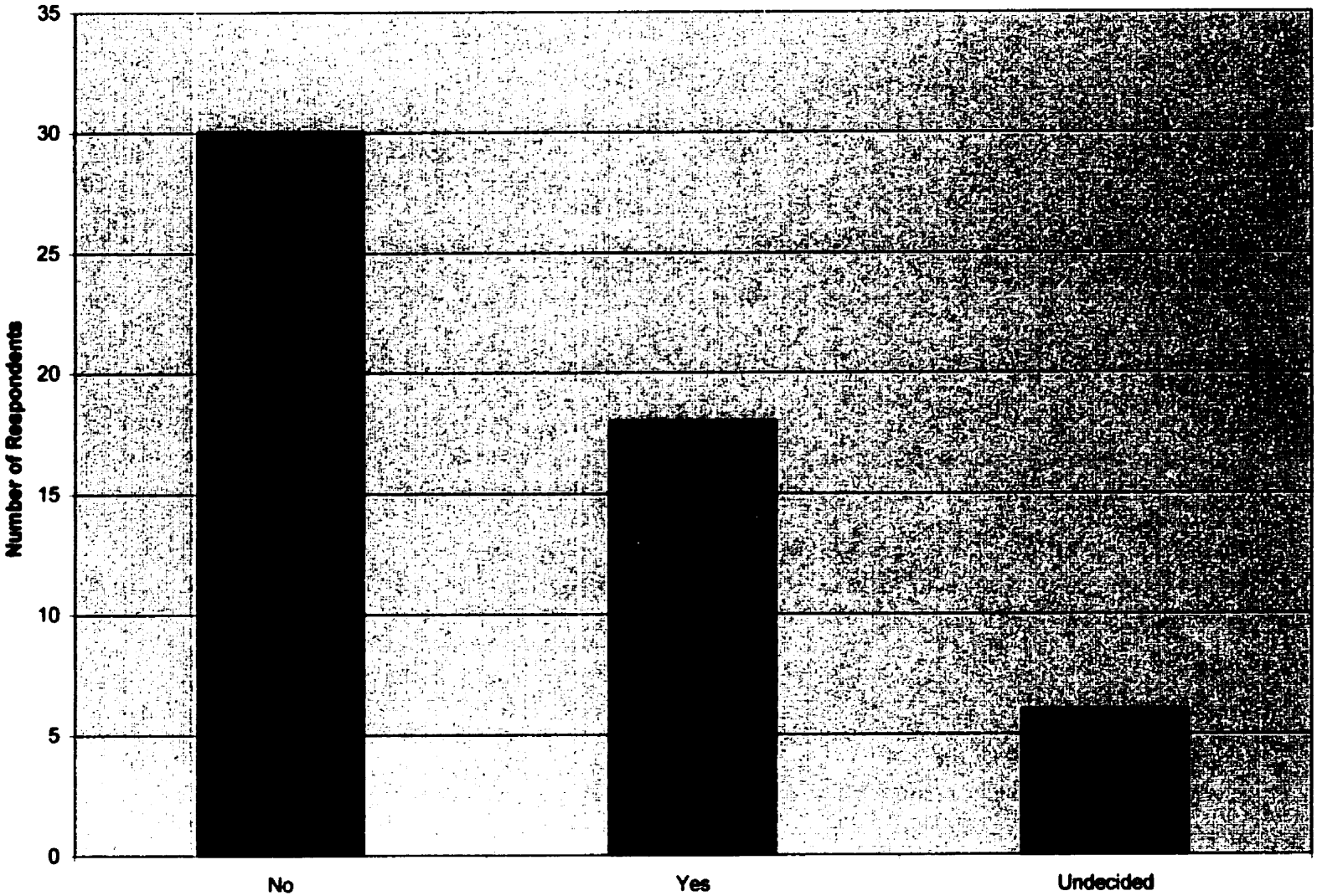
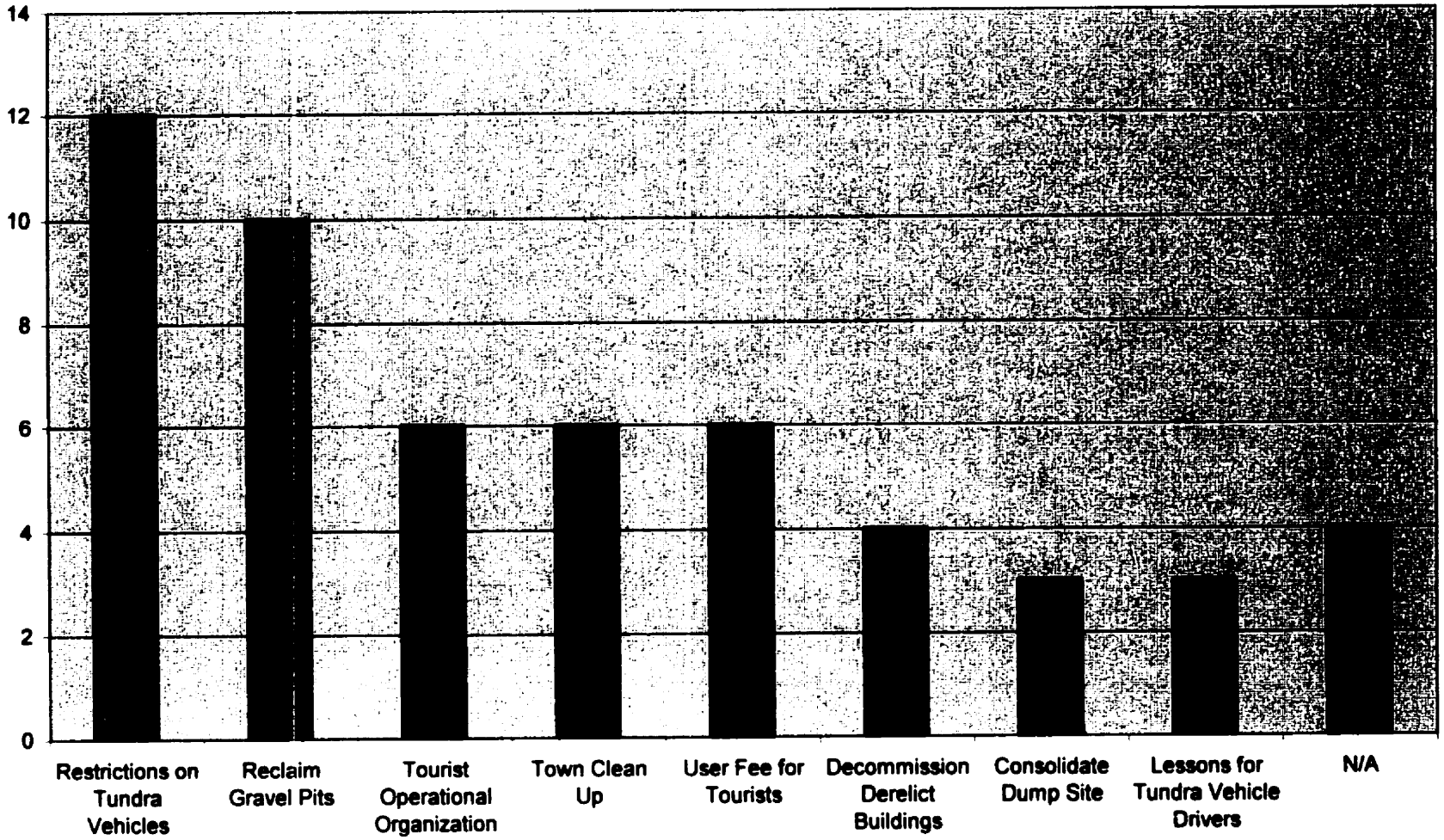


Figure 14: Community Recommendations for a Sustainable Environment



Churchill would be a round table composed of tourism operators gathering to discuss local tourism objectives, concerns and recommendations. As Mike Macri (pers. comm. July 1999) suggested, the tourism operational organization would serve to coordinate the activities of all the tourism operators in Churchill. Although the Town has become dramatically cleaner over the past few years, six respondents felt that additional clean up would contribute to a sustainable environment. In 1998, the Town of Churchill funded a community beautification project, which has successfully restored streets, signs and some buildings in the community (Town of Churchill 1999). Community respondents are eager to see this work continued so that tourists and local residents will be treated to a more aesthetically pleasing environment.

Another recommendation mentioned by respondents was the institution of a user fee for tourists (n=6). The user fee would be a one-time fee applied to tourists entering the Churchill Wildlife Management Area. One respondent suggested that a user fee for tourists would allow management agencies to direct revenue to environmental rehabilitation and conservation programs (Anonymous pers. comm. July 1999). Other recommendations for a sustainable environment included decommissioning derelict buildings (n=4), consolidation of the local dump (n=3), and lessons for tundra vehicle drivers (n=3).

4.3 Social Aspects of Churchill

Churchill has faced many obstacles in retaining its culture and social well-being (Dredge 1992). The struggles of the Sayisi Dene First Nation in the 1970s demonstrated how one group fought to retain their heritage in the face of persecution. Often tourism development does not reflect the cultural needs of the people of the north (Sherman and

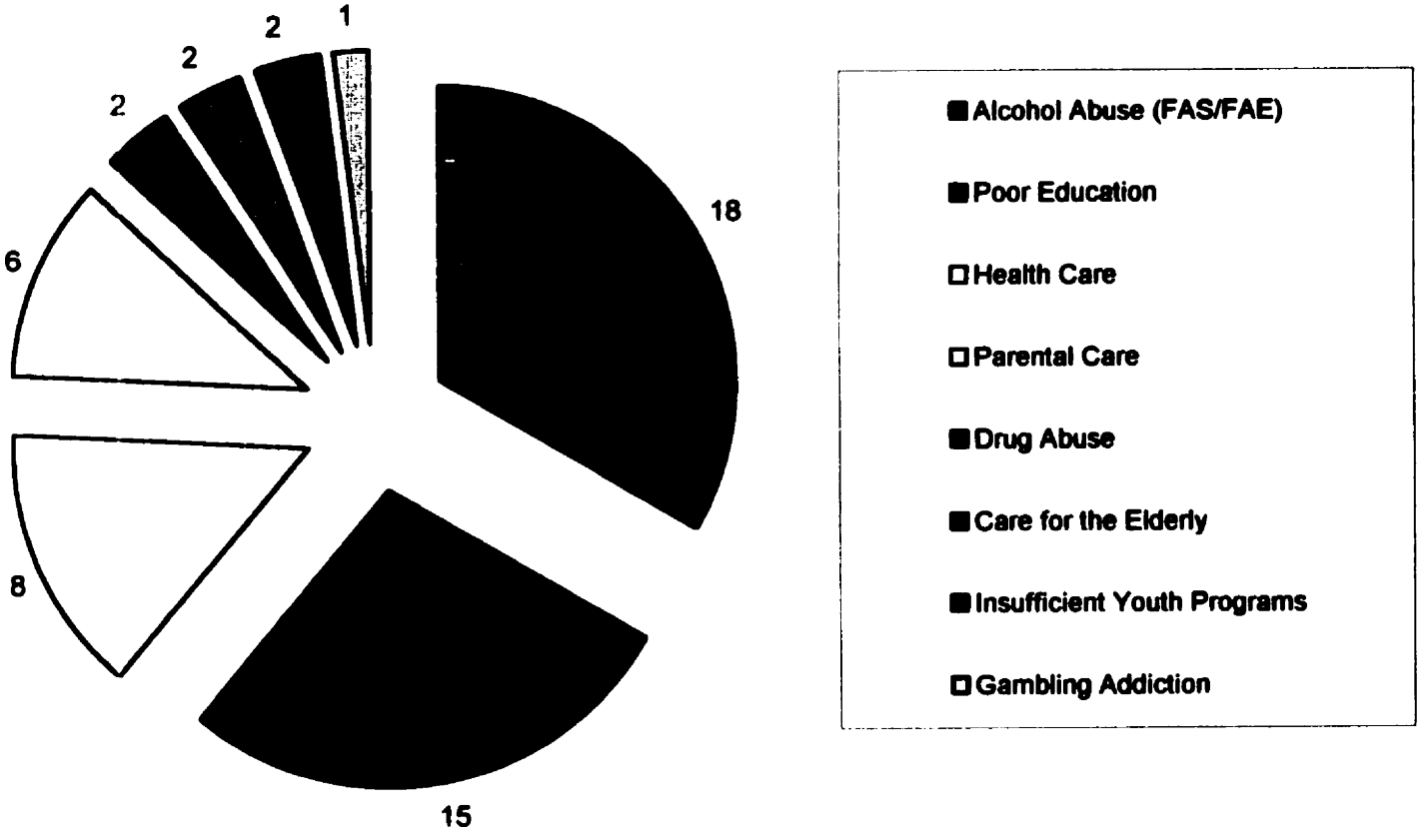
Dixon 1991). Smith (1989) argues that because hosts and guests have different cultural and economic values, over time animosity may grow between them. Historically, industrial development in the Town has been variable and erratic, causing uncertainty in terms of employment, health and well-being (Dredge 1992).

4.3.1 Social Concerns

Figure 15 illustrates the main social concerns of the respondents in Churchill. The highest number of respondents (n=18) felt that alcohol abuse was their main social concern. According to Brenda Wohlgemuth of Churchill's Regional Health Authority, one of the significant problems associated with alcohol abuse is the high number of Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effect (FAE) incidences (pers. comm. July 1999). FAS and FAE occur when expectant mothers consume alcohol during their pregnancy. Poor education ranked second as the respondents' main social concern (n=15). As mentioned in Chapter III, the education facilities in Churchill are much better than most northern communities. However, students in Churchill are not performing at a level that is adequate for administrators, teachers or parents. In 1998 only 1 student graduated from grade 12, out of a possible 16 (RHA Inc. 1999). One respondent contended that the lack of student success could be attributed to the curriculum that is not sufficiently rigorous or culturally sensitive (Anonymous pers. comm. July 1999).

Next to alcohol abuse and poor education, the current status of the health care system was the third main social concern (n=8). One respondent commented, "Even though Churchill's Regional Health Authority is well-serviced and equipped, many of the community members don't feel that it adequately serves their needs" (Anonymous pers. comm. July 1999). As mentioned in Chapter III, this concern surrounding the RHA is

Figure 15: Main Social Concerns in Churchill



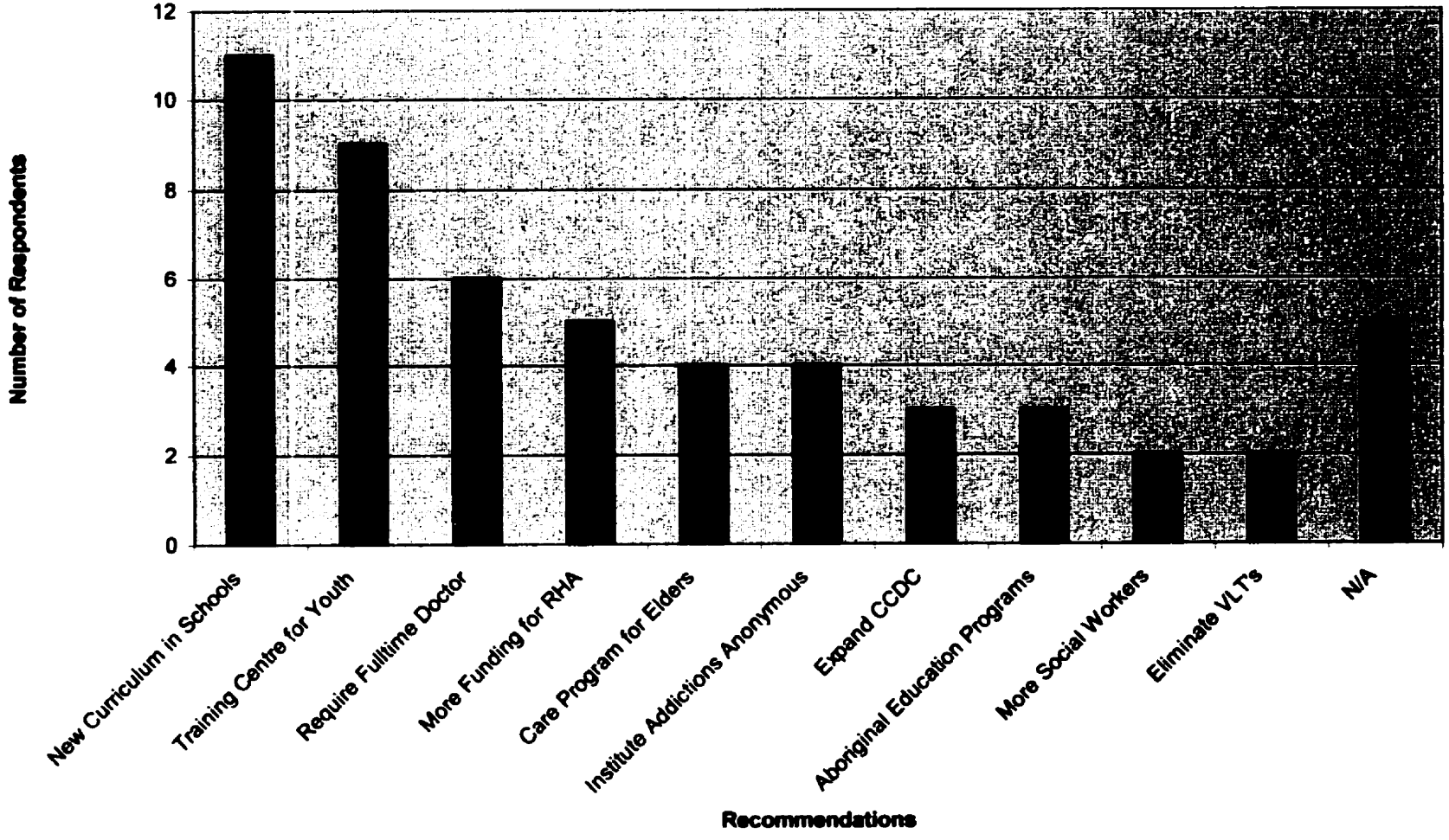
due in part because doctors and nurses usually only stay in the community for 2-year terms. The short terms of the health care providers do not allow sufficient time for residents to build a rapport with their providers, which in turn cause residents to mistrust their health care system (RHA Inc. 1999).

Parental care was cited by six respondents as their main social concern. A study performed in Churchill in 1997 found that a lack of parental care at home correlates with poor educational performance and peer interaction (RHA Inc. 1999). One community respondent stated that many children do not receive adequate care at home because some parents are involved in alcohol and drug abuse (Anonymous pers. comm. July 1999). Fewer stakeholders felt that drug abuse, care for the elderly and insufficient youth programs were their main social concerns at n=2 respectively. One respondent was concerned about gambling addictions, related to the presence of video lottery terminals (VLTs) in the community.

4.3.2 Recommendations for a Sustainable Community

Respondents were asked what recommendations they would make to improve the health of their community (Figure 16). Eleven respondents said that implementation of a new curriculum in schools would improve the health of their community. One respondent stated that a new curriculum combining northern perspectives and aboriginal history would be more suited to Churchill's youth (Anonymous pers. comm. July 1999). Nine respondents recommended that the establishment of a training centre for youth would also help to improve the health of the community. One respondent stated that a supervised youth centre could provide children with a safe place to develop and interact (Anonymous pers. comm. July 1999). Six respondents said that a full-time doctor

Figure 16: Recommendations for a Sustainable Community



committed to staying for at least five years would improve the community by establishing a trust and rapport with the community members. The need for more funding for the RHA was another recommendation suggested by the respondents (n=4). One respondent commented that "the availability of more funding for the RHA might result in more permanent doctors and nurses" (Anonymous pers. comm. July 1999). Next to funding requirements for the RHA, the institution of an addictions anonymous group (n=4) and the expansion of the Churchill Community Development Corporation (n=3) were recommendations made to improve the community. The Churchill Community Development Corporation is an agency that lends small amounts of money to new businesses; expansion of their services would allow more local projects to go forward. Fewer respondents recommended the need for aboriginal education programs (n=3), more social workers (n=2), and the elimination of VLTs (n=2).

4.4 Economic Aspects of Churchill

Churchill's economy has undergone many changes in the past, but today is based on the RHA, tourism, Port facility and transportation services. People come to visit Churchill during the bird season in the spring, and to view beluga whales in the summer, polar bears in the fall, and northern lights in the winter, creating an influx of approximately 20,000 visitors annually (Town of Churchill 1999).

The prospects for the economic development of Churchill are encouraging. The creation of Wapusk National Park is further enhancing the area as a tourist destination. The purchase of the Port and rail line by OmniTRAX may also allow Churchill to become the hub of a north-south transportation corridor. This section examines

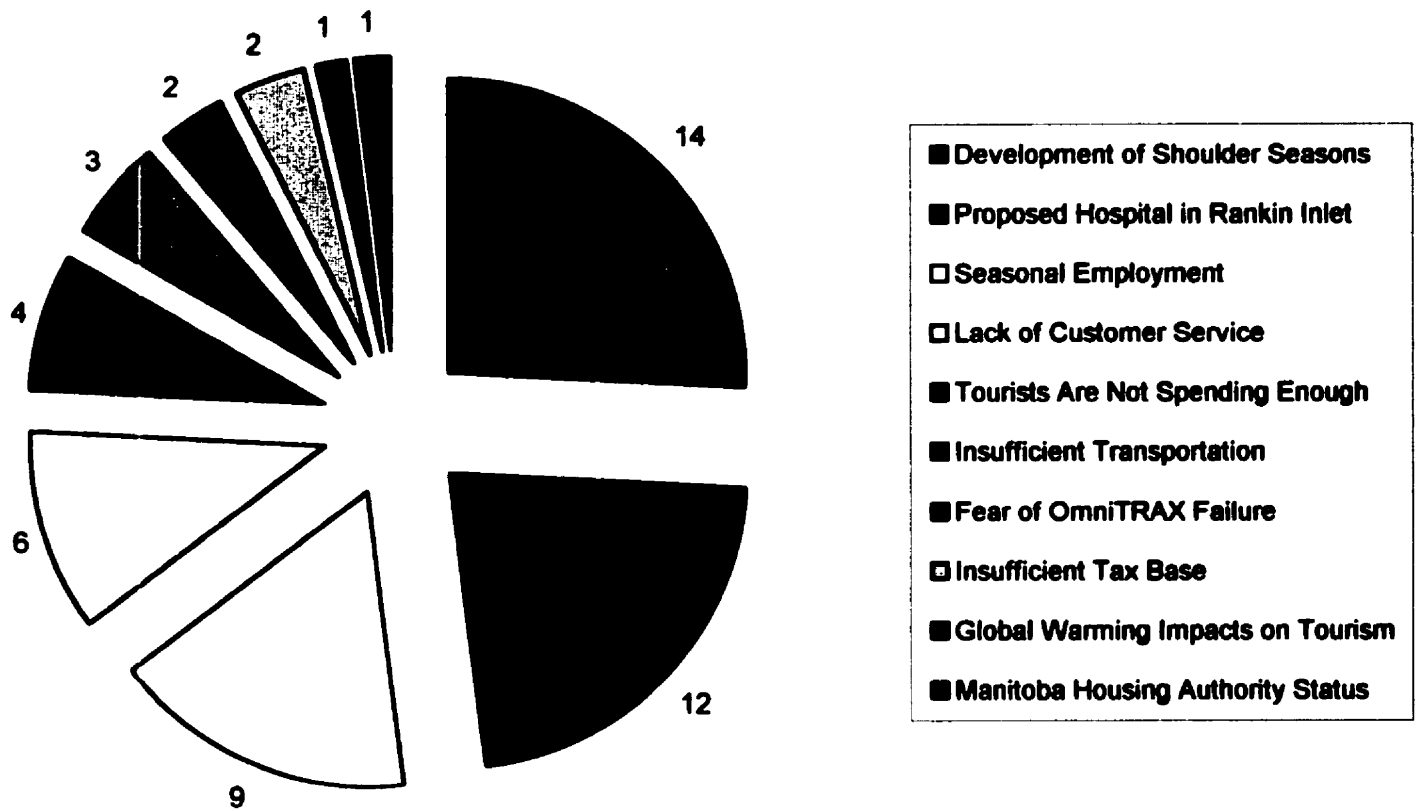
Churchill's economic concerns, perceptions of development and recommendations for a sustainable economy.

4.4.1 Economic Concerns

Figure 17 illustrates the main economic concerns in Churchill. The highest number of respondents (n=14) felt that the development of shoulder seasons was their main economic concern. The concern associated with shoulder seasons is that Churchill is not taking full advantage of the tourism seasons available in the community. The development of shoulder seasons would involve the expansion of existing tourism activities, and the creation of new tourism activities that would provide employment throughout a longer portion of the year (DNR 1999). The second largest economic concern in Churchill is the proposed hospital in Rankin Inlet (n=12). For several years, the community of Rankin Inlet has been trying to generate enough funding to build their own hospital. Presently, residents from Rankin Inlet and surrounding communities use the Churchill RHA for their health needs (RHA 1999). According to one respondent, the development of a hospital in Rankin Inlet would dramatically reduce the number of patients and economic activity in Churchill's RHA (Anonymous pers. comm. July 1999).

Next to the development of shoulder seasons and the hospital in Rankin Inlet, the high level of seasonal employment was the third main economic concern (n=9). As Figure 11 showed, almost 50% of respondents were seasonally employed. The concern with seasonal employment is that residents are forced to rely on government subsidies for the remainder of the year (RHA Inc. 1999). A lack of customer service and the feeling that tourists were not spending enough in Churchill ranked 4th and 5th as the respondents' main economic concerns at n=6 and n=4 respectively. The community concern about a

Figure 17: Main Economic Concerns in Churchill



lack of customer service was not reflected in an exit survey of tourists in 1997 that found 72% of tourists very satisfied with their visit to Churchill (MacKay 1997). This study would seem to suggest that while tourists are generally pleased with service in Churchill, community respondents feel that further improvements still need to be made. One respondent stated that if improvements were made in the delivery of customer service, tourists would be willing to spend more money (Anonymous pers. comm. July 1999). This observation was supported by a tourist survey conducted in 1998 that found that tourists were leaving the community with an average of $400-$500 of unspent travel money (Travel Manitoba 1999). Fewer respondents felt that the potential failure of OmniTRAX, an insufficient tax base, global warming and Manitoba Housing Authority's status were main economic concerns at n=2, n=2, n=1 and n=1 respectively.

4.4.2 Are you Optimistic about the Port?

Figure 18 illustrates the current optimism surrounding the Hudson Bay Port Company. The Port has recently been transferred from the Canadian federal government to OmniTRAX Inc., a private American firm (OmniTRAX 1998). Since the transfer, OmniTRAX Inc. has been aggressively marketing the Port and its services. Of the fifty-four respondents asked about their view of the current situation with the port, forty-nine stated that they were optimistic. Over the last thirty years, community respondents have seen the gradual decline of shipping through the Port. It appears that the community is now excited to see a company aggressively trying to make it successful. A small number of respondents (n=5) said that they were not optimistic about the viability of the Hudson Bay Port Company. One respondent stated that it is too early to tell whether or not

OmniTRAX will be able to make the Port viable once again (Anonymous pers. comm. June 1999).

4.4.3 Are you Optimistic about the Research Range?

Churchill's Research Range is a rocket facility that had more launches than any other site in the world between 1958 and 1985 (Tetres 1997). In 1993, Akjuit Aerospace was successful in leasing the range from the Government of Manitoba. Akjuit planned to revive and renovate the facility with private and public funding. Akjuit was unsuccessful because of financial and technological constraints (Cory Young pers. comm. July 1999). The Town of Churchill is presently attempting to find another potential investor for the research range.

Figure 19 shows the responses to the question, "Are you optimistic about the research range?" Forty-nine respondents were not optimistic that the research range would become viable again. The majority of respondents do not think that the Town of Churchill will secure a future investor for the research range. One respondent suggested that the research range should no longer be pursued as an economic development sector for Churchill because it can no longer compete with the American aerospace industry (Anonymous pers. comm. June 1999). Only five of the respondents thought the research range would once again become operational.

4.4.4 What Type of Impact will Nunavut have?

The establishment of the Nunavut Settlement Region on April 1, 1999 has created a lot of interest and optimism about the increased economic opportunities for Churchill. Figure 20 shows the respondents' views about what type of impacts the establishment of Nunavut will have on Churchill. The highest number of respondents (n=18) thought

Figure 18: Are you Optimistic about the Hudson Bay Port Company

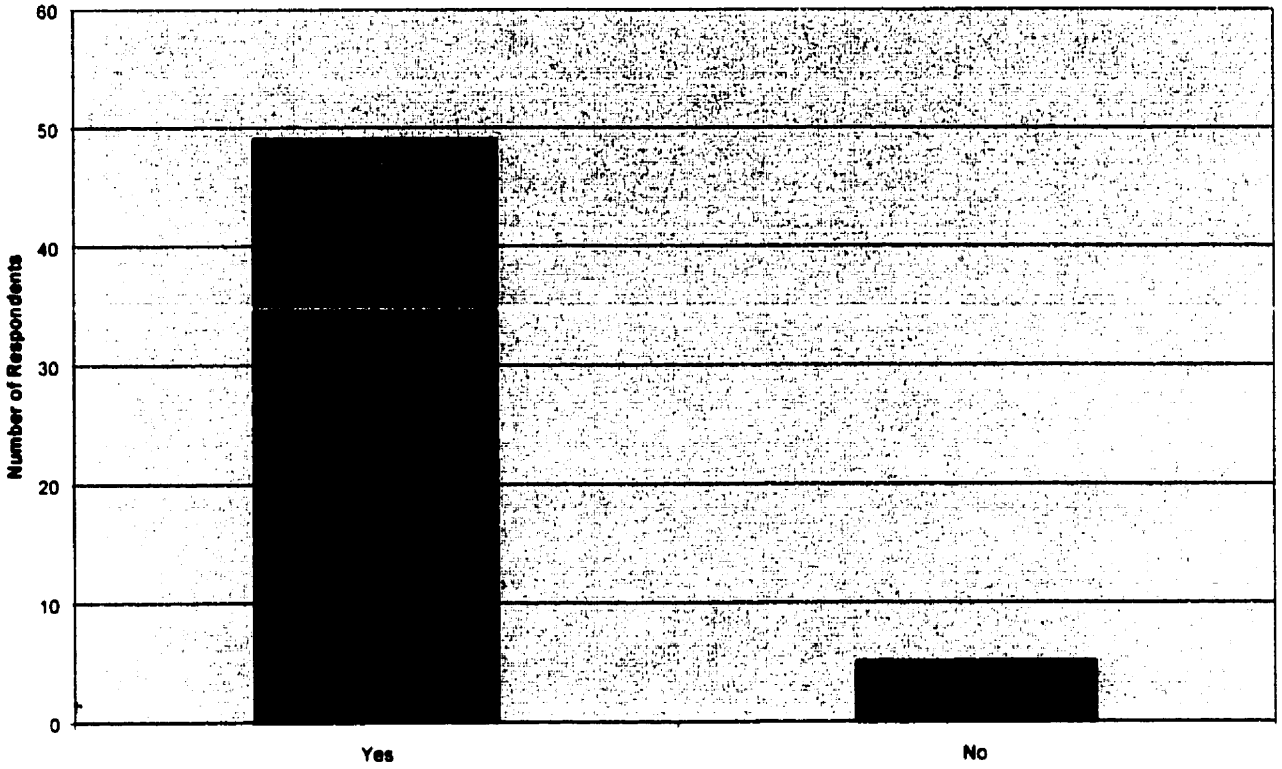


Figure 19: Are you Optimistic about the Research Range

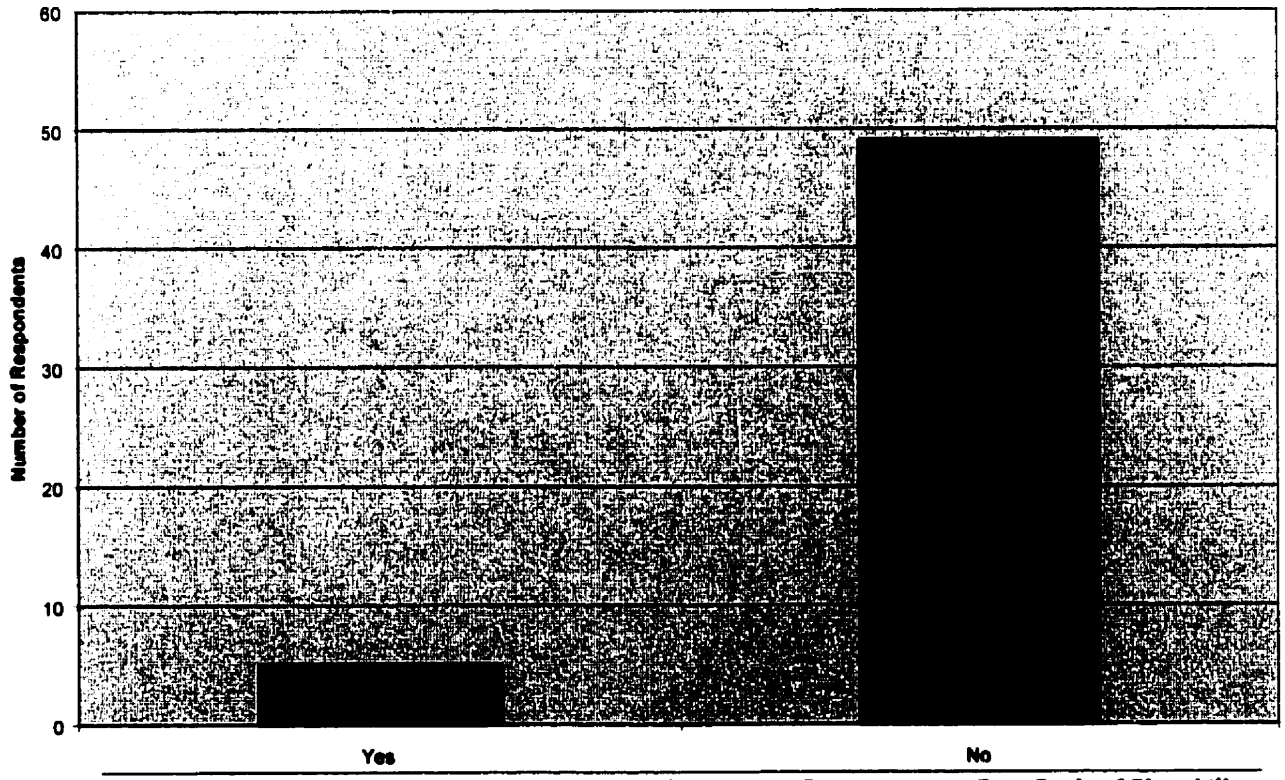
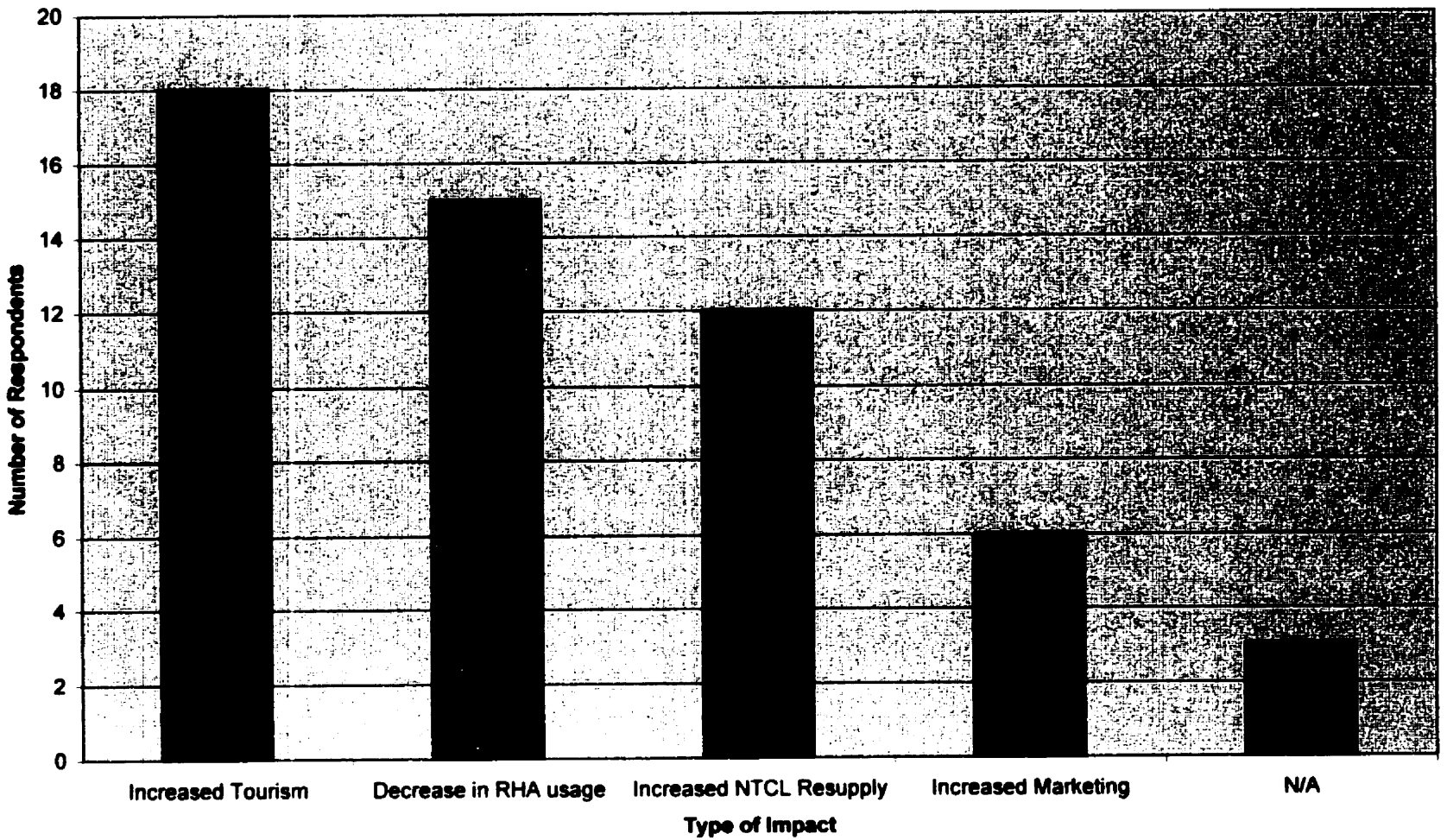


Figure 20: What Types of Impacts will Nunavut have on Churchill?

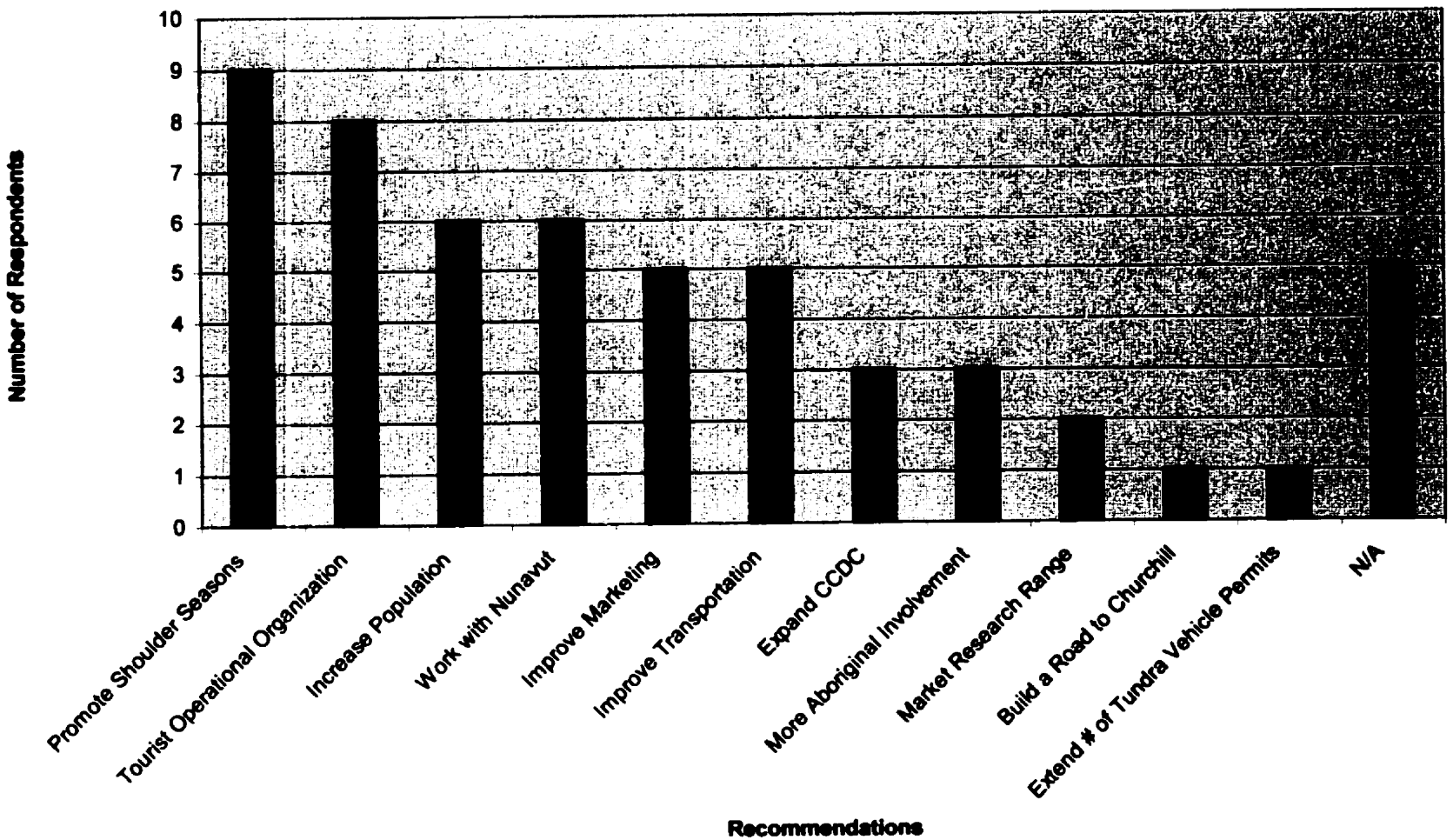


tourism opportunities would increase with the establishment of Nunavut. For example, one respondent suggested that Churchill could develop tourism opportunities, such as dogsledding and cultural tours with Nunavut (Anonymous pers. comm. July 1999). Fifteen respondents thought the establishment of Nunavut would result in decreased usage of the RHA Inc. The Churchill Health Centre presently receives a large number of its patients from the Nunavut region. The possibility of Rankin Inlet building its own hospital, could result in the decreased usage of the RHA. Twelve respondents felt that the establishment of Nunavut would increase resupply opportunities for the Northern Transportation Company Limited (NTCL). NTCL is currently the principal transportation link for the movement of bulk petroleum products and dry cargo to communities and oil and gas exploration sites in the Territory of Nunavut. Fewer respondents (n=6) mentioned that Nunavut will increase the marketing of the Town of Churchill. One respondent commented, "Press and media coverage of the new Territory will undoubtedly create exposure for Churchill" (Anonymous pers. comm. May 1999).

4.4.5 Community Recommendations for a Sustainable Economy

Figure 21 shows the respondents' answers to the question, "What recommendations would you make to ensure a sustainable economy for Churchill?" The promotion of shoulder seasons was mentioned by the most respondents (n=9) as a way of improving the health of the economy. This could be accomplished through a variety of strategies, including: developing and marketing winter tourism products and tours that support aboriginal cultures, by increasing the profile of spring-summer attractions, and by promoting under capacity time-periods such as the first few weeks of the whale watching and bear seasons (DNR 1999). The development of a tourism operational organization

Figure 21: Community Recommendations for a Sustainable Economy

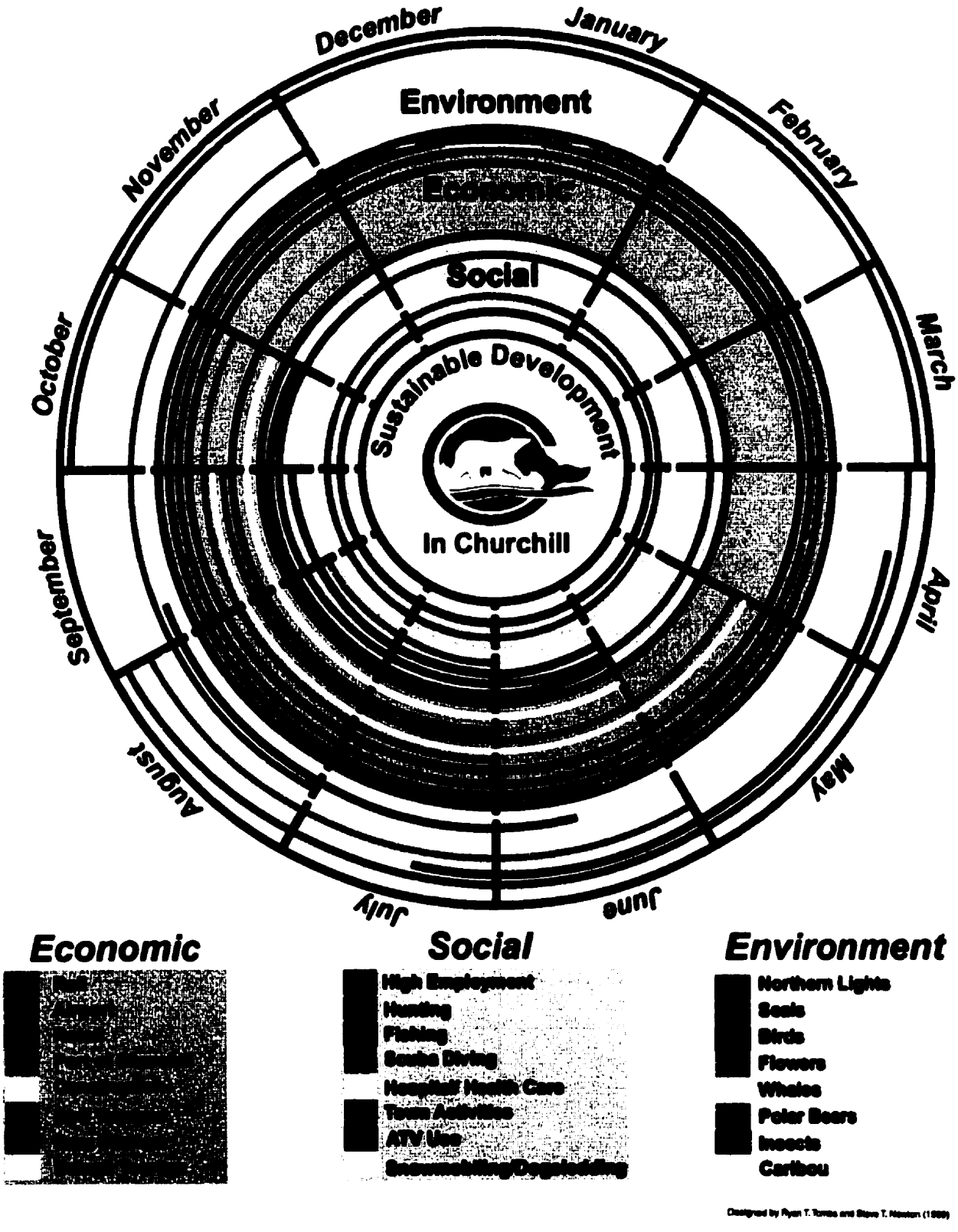


was also a recommendation (n=8) for building a sustainable economy. Mike Macri, Sea North Tours, stated that the establishment of a tourism operational organization would help to coordinate the activities of the tourism operators in Churchill (pers. comm. July 1999). As mentioned earlier, population in the Town of Churchill has decreased over the last 30 years. Six respondents felt that a larger population would help to ensure a more sustainable economic future. The success of the HBPC and the expansion of tourism shoulder seasons could provide the impetus for a larger population base. The ability to work alongside Nunavut for economic development was recommended by six respondents. Improved marketing of the Town of Churchill, and improvement of the transportation system ranked 5th and 6th as recommendations for a sustainable economy at (n=5) respectively. Three respondents mentioned the expansion of the Churchill Community Development Corporation as a way of stimulating small business and economic development. Other recommendations for a sustainable economy included increased aboriginal involvement (n=3), marketing of the research range (n=2), building a road to Churchill (n=1), and extending the number of tundra vehicle permits (n=1).

4.5 Concentric Rings

Figure 22 illustrates the main annual environmental, social and economic activities in concentric rings. During the interviews, respondents were asked to describe the types and extent of activities that occur in Churchill. These data were then compiled and sorted into three rings delineating social, economic and environmental activities. The economic ring portrays the annual extent of the rail line, airport, retail, Hudson Bay Port Company, construction, bird tourism, bear tourism and beluga tourism. The social ring portrays the annual extent of high employment, hunting, fishing, scuba diving,

Figure 22: Concentric Rings Depicting Annual Social, Economic and Environmental Activities in Churchill



hospital/health care, Town activities, ATV use, and snowmobiling/dogsledding. The environment ring depicts the annual extent of the northern lights, seals, birds, flowers, whales, polar bears, insects and caribou.

4.6 Confirmation Visit

On September 7, 1999 the researcher traveled back to Churchill to confirm research results with the community. The researcher had a display booth set up in the Churchill Town Centre that contained a poster depicting "Sustainable Development in Churchill", the concentric rings illustrating annual social, economic and environmental activities, and handouts describing the research. In total, ninety Churchill residents stopped by the display booth, including two groups of science students from the Duke of Marlborough School. The age range, sex and ethnicity of the visitors are shown in Table 8.

Table 8: Confirmation Visit

Age Range	Sex		Ethnicity	
	Male	Female	Aboriginal	Non-Aboriginal
>65	2	6	1	7
46-65	12	6	4	14
20-44	10	11	6	15
14-19	13	8	12	9
5-13	8	8	10	6
<5	3	3	5	0
Totals	48	42	34	56
Total Number of Churchill visitors = 90				

4.7 Summary

In conclusion, the responses of those interviewed have shown that community members have a keen sense of their economy, environment and social well-being. Furthermore, Churchill respondents are generally very optimistic about the development opportunities for the community. However, they recognize that economic development should not ignore the social and environmental factors associated with development. The responses form an effective platform toward building a sustainable vision of the future and strategic work plan for achieving it.

Chapter 5

Churchill in the 21st Century: A Future Scenario

5.0 Preamble

An important consideration in building sustainable communities is to have a clear vision for the future. The development of scenarios is one tool that a community can use to predict future patterns and develop strategies to achieve their goals (IISD 1999). The purpose of this chapter is to link and analyze the literature review and community responses to form a future sustainable scenario of Churchill in 25 years. A backcasting framework is used to identify areas of priority for sustainable development.

5.1 The Sustainable Vision of Churchill

The vision of a sustainable future for Churchill is based on a grassroots concept of sustainable development which incorporates the views of the community. This vision describes a Town in which all residents are able to maintain and enjoy a quality of life that meets their particular needs and expectations. According to Roseland (1992), the following principles characterize a sustainable community:

Sustainable Economy: A sustainable economy involves:

1. a local economy that is stable and diversified;
2. relying on local strengths and resources, and encouraging local initiatives; and
3. providing year-round employment for local residents.

Sustainable Environment: A sustainable environment involves:

1. recognizing that growth occurs within limits and is restricted by the carrying capacity of the environment;

2. minimizing harm to the natural environment; and
3. using materials in continuous cycles.

Sustainable Community: A sustainable community involves:

1. valuing cultural diversity;
2. making decisions and plans in a balanced, open and flexible manner that includes the perspectives of the community; and
3. encouraging fair distribution of benefits among all members, including the disadvantaged.

This community-based vision for Churchill's future anticipates evolution and improvement, which transforms local communities and residents. It accommodates large-scale export-oriented development via the Hudson Bay Port Co. of benefit to all Manitobans and Canadians, provided that such developments do not threaten the viability of resource use by the community. The vision for Churchill also focuses on small-scale, local initiatives available to maintain and enhance quality of life for Churchill residents. It recognizes a need to foster decision-making processes that build consensus and cooperation among all the stakeholders in Churchill.

5.2 Components of a Sustainable Churchill in 25 Years

This section outlines the specific components of a sustainable Churchill in 25 years, as they relate to transportation, tourism, industry, and social development. These components are based upon the aforementioned principles of a sustainable economy, environment and community. Table 7 summarizes the future scenario of Churchill.

Table 7: A Future Scenario of Churchill in 25 Years

Sustainable Development Principles For Churchill	Components of a Sustainable Churchill	Areas of Priority for Sustainable Development	
Sustainable Economy			
1. A local economy that is stable and diversified 2. Relies on local strengths and resources, and encourages local initiatives 3. Provides year round employment for locals	***Transportation Sector*** 1. Shipment of 1 million tonnes annually 2. Integrated delivery system 3. Establishment of two-way trade 4. Increased resupply by NTCL ***Tourism Sector*** 1. Improved accommodations 2. Development of tourism shoulder seasons 3. Coordinated transportation (air, rail, port) ***Industry and Business Sector*** 1. Conclusion of Spaceport activities 2. Establishment of SpacePort museum 3. Small business expansion ***Social Development Sector*** 1. Expansion of the RHA 2. Linkages between institutions	1. Amount of seasonal employment 2. Lack of transportation coordination 3. Lack of aboriginal involvement 4. Current HBPC shipment levels	
Sustainable Environment			
1. Recognizes that growth occurs within limits and is limited by the carrying capacity of the environment 2. Minimizes harm to the natural environment 3. Uses materials in continuous cycles	***Transportation Sector*** 1. Implementation of OmniTRAX guidelines 2. Coordination between sectors ***Tourism Sector*** 1. Establishment of tourism organization 2. Wildlife viewing policies 3. Increased role of Wapusk ***Industry and Business Sector*** 1. Avoidance of Spaceport impact ***Social Development Sector*** 1. Recycling and reusing waste products	1. Existing military sites 2. Tundra vehicle and ATV damage 3. Existing gravel pits 4. Global warming	
Sustainable Community			
1. Values cultural diversity 2. Makes decisions and plans in a balanced, open and flexible manner that includes the perspectives of the community 3. Equity: Encourages fair distribution of benefits among all members, including the disadvantaged	***Transportation Sector*** 1. Issues of northern sovereignty 2. Service to northern communities ***Tourism Sector*** 1. Increased aboriginal involvement 2. Employment and educational partnerships ***Industry and Business Sector*** 1. Smaller businesses and self-sufficiency ***Social Development Sector*** 1. A more stable population base 2. New RHA mandate 3. New school curriculum	1. Current status of education 2. Insufficient care for the elderly 3. Alcohol and drug abuse	

5.3 Transportation

The transportation sector, 25 years from now, will continue to be one of the most important aspects of Churchill. A sustainable transportation sector would require an active Port and a coordinated effort by the rail and airline sectors. The following sections will describe how a sustainable transportation system could be achieved.

5.3.1 Economic Components

If the Hudson Bay Port Co. is to be sustainable in the future, it must increase its shipping tonnage. The break-even tonnage for the Port is about 600,000 tonnes annually to cover operating expenses and 1 million tonnes annually for total costs (Alan Johnson pers. comm. July 1999). As OmniTRAX is the new owner of the rail and Port facilities, they are the marketers and the catalysts to stimulate the initial phases of Port expansion. In the future, OmniTRAX will require an integrated rail and Port approach to coordinate traffic and provide the personalized customer service required for niche markets and smaller volume sales. The Hudson Bay Port Company will also need to enhance movement of inward bound traffic. By operating as an integrated system, the profitability of the total system will be enhanced (Canada Grains Council 1997). The future scenario will need to consider:

1. Diversification of the grain traffic to include alternate crops such as peas and lentils;
2. Diversification of bulk commodities such as potash;
3. Adoption of containerized service to handle not only specialty crops but also other commodities such as farm machinery; and
4. Development of two-way trade opportunities, such as phosphates, copper, and forest products from Europe and Africa (OmniTRAX 1998).

The Northern Transportation Company Limited will continue to be a vital component of the transportation system into the next millennium (OmniTRAX 1999, NTCL 1999, Winnipeg Free Press January 22, 1999). NTCL traffic is presently 35,000 tonnes annually (9,000 tonnes dry products, 26,000 tonnes fuel). As one respondent suggests, the establishment of the Territory of Nunavut and the corresponding agreement between Nunavut and Manitoba to maintain Churchill as a "Gateway to Nunavut", should result in increased shipments (Anonymous pers. comm. July 1999). According to Figure 20, twelve respondents agree that the establishment of Nunavut will increase the resupply opportunities for NTCL.

The airport is another important consideration in the sustainable development of the transportation sector. In 1998, the airport employed 37 people directly and 82 people indirectly, contributing a total of $14 million in direct and indirect revenues to Churchill (Anonymous pers. comm. June 1999). The construction of a new terminal/hangar in 1999 will improve transportation in the future scenario by enabling the airport to accommodate increasing numbers of aircraft and passengers, reduce heating and other operating costs and handle increased traffic volumes for air freight moving to more northerly locations (Calm Air 1999, Winnipeg Free Press June 19, 1999).

5.3.2 Environmental Components

The transfer of the Port from public to private interests in 1997, involved bringing the Port facilities up to environmental standards (OmniTRAX 1998). The majority of these tasks have been completed, including dust control and the remediation of contaminated soils surrounding the marine tank farm. OmniTRAX has also stated that they now plan to operate the Port in an environmentally friendly manner. The

implementation of OmniTRAX's environmental guidelines is a requirement for the sustainable development of the transportation sector (OmniTRAX 1998).

Another important environmental consideration for the transportation sector is the coordination of their activities with tourism and wildlife guidelines. As the potential for Port activity increases in the new millenium, conflicts may arise between shipping and whale watching. As five respondents noted, dredging of the Port may have impacts on the viability of wildlife using the Churchill River estuary (Figure 12). An integrated management plan incorporating a Marine Protected Area under Canada's *Oceans Act* (1997) may help to ensure the successful coexistence of shipping, tourism and wildlife. Integrated management could provide a continuous, transparent decision-making process developed by stakeholders to integrate planning and implementation of activities and policies affecting Hudson Bay (DFO 1999a).

5.3.3 Social Components

The maintenance and improvement of Churchill's transportation activities will have continued impacts on Canadian sovereignty in the future scenario. The operation of a Port and rail links to Hudson Bay provides commercial shipping traffic through areas where Canadian claims to sovereignty have been contested (Arctic Bridge 1994, Winnipeg Free Press February 5, 2000). The existence of these activities is a valuable supplement to the military and other government projects meant to confirm the Canadian presence in this territory, which could have implications for future gas and mineral claims (Anonymous pers. comm. June 1999).

The transportation sector in the future also has the opportunity to affect other social aspects of the north. People in the Territory of Nunavut can continue to take

advantage of Churchill's high quality and relatively convenient health facilities. Employment opportunities may also expand for both aboriginal and non-aboriginal residents in Churchill. Many jobs of suppliers and Canadian National and VIA Rail employees in Winnipeg and other communities including Churchill depend directly on the freight and passenger services to Churchill (Norman RDC 1997).

5.4 Tourism

Tourism, 25 years from now, will continue to stimulate economic growth and will complement the shipping and transportation sectors. This section outlines the specific economic, environmental, and social components that could comprise a sustainable tourism industry in the future.

5.4.1 Economic Components

Tourism in Churchill is capable of improving its economic viability in the future because it offers a way to diversify the economy with relatively low capital investment, while making fuller use of existing transportation facilities (DNR 1999). The possibility for further tourism growth lies in the fact that there is considerable untapped potential in the Town and surrounding region. One respondent stated that many tourists are seeking imaginative and varied experiences, and are increasingly interested in adventure travel, wilderness vacations and aboriginal cultural events, which at present are not generally made available in the town (Anonymous pers. comm. July 1999).

Improving tourism and the accompanying expansion of local employment will depend upon maintaining the transportation infrastructure, expanding shoulder seasons, and providing improved accommodations. Attracting more tourists requires not only the existence of transportation services, but also high standards of integrated transport

facilities, which allow easy access when two or more modes are involved (OmniTRAX 1998). A recent example of this integrated transport is the cruise ships working alongside VIA Rail and Calm Air. Tourists arriving on the ships, spend a day or two in the community and then have the option of linking with another mode of transport (Calm Air 1999). This type of tourism has the potential to expand in the future.

The ability of Churchill to develop shoulder seasons will have many implications for the future sustainable development of the community. Shoulder seasons for Churchill relate to the birth and expansion of tourism activities that would help to spread the industry throughout a greater portion of the year. With the polar bear tourism (Oct and Nov) almost at full capacity, future tourism growth must occur in another sector (i.e. beluga whales, northern lights, etc.)(DNR 1999). Judging from the respondents' recommendations, the community is optimistic that they will be able to diversify and expand tourism in the future.

5.4.2 Environmental Components

As the volume and demand for tourism grows in Churchill, the possible implications for environmental damage may also increase. Permanent tundra damage, disturbance of wildlife and pollution of aquatic and terrestrial ecosystems have all been cited as possible negative environmental outcomes of tourism growth in Churchill (DNR 1999). The challenge, then, is to direct tourism toward activities that improve the environmental integrity of the region, and ensure a sustainable tourism industry for generations to come. The following paragraphs describe several steps the community could take to encourage a more sustainable tourism industry.

The establishment of a tourism operational organization could provide structure and monitoring to both the tourism operators and visitors. Mike Macri, the owner of Sea North Tours, stated that a regulatory body comprised of all the tourism outfitters is needed for the sustainable development of the Town (pers. comm. July 1999). Such an organization could facilitate communication between the tourism operators and enforce restrictions on environmentally damaging practices. With the aid of departments such as, Department of Conservation and the Department of Fisheries and Oceans, the Town could also encourage sustainable tourism through the implementation of policies that govern wildlife viewing. These policies would forbid the baiting of bears, establish beluga whale viewing guidelines, and provide structure to the bird watching activities.

The establishment of Wapusk National Park on the outskirts of the Town of Churchill has positive implications for the future of the environment. The presence of this habitat management agency in the community may help to regulate and enforce legislation concerning the environment (Ernie Depatie pers. comm. July 1999). The park is currently developing a management plan that will focus on the maintenance and improvement of the park environment.

5.4.3 Social Components

The tourism industry presently contributes to social well-being in the form of local income generation and employment. Tourism in the future scenario has the opportunity to expand the level of economic growth and employment, as well as providing new opportunities for underrepresented individuals. Churchill has a large aboriginal population, which is generally not well represented in the tourism industry. Historically, lack of communication between racial groups in Churchill has deterred

support of traditional lifestyles and the guidance of incorporating those traditions within educational tourism experiences (Anonymous pers. comm. July 1999). Better communication between groups in the tourism sector could ensure both a cultural and economic opportunity for the aboriginal population. Aboriginal individuals could be supported in developing tourism educational opportunities. Such opportunities include traditional hunting and fishing trips, and overnight camping trips, which teach the tourists about traditional lifestyles.

Building educational partnerships between industry and the community is an important step in sustainable development (Henderson 1990). One potential educational partnership could exist between the Department of Conservation and the local public school. The partnership could provide employment training to high school youths in such areas as guiding and interpreting regional features to tourists. During the summer months, the youths could work with local tourism outfits, which would support the needs of both the youth and local tourism businesses.

5.5 Industry and Business Development

The industry and business sector, 25 years from now, may undergo significant changes in its structure and operation. The research range, which provided employment and economic growth in the past, will no longer be a significant component of the community. Smaller businesses involving aboriginal entrepreneurs may begin to characterize this sector because of increased opportunities and government funding.

5.5.1 Economic Components

Akjuit Aerospace was not successful in revitalizing the Churchill Research Range. As a result, the facilities remain unused but fully operational. Cory Young, CEO

of the Town of Churchill is still optimistic that they will find an investor to operate the facility in a limited capacity (pers. comm. June 1999). However, the vast majority of community respondents stated that they are not optimistic about the possibilities associated with the research range (Figure 19). One alternative associated with the research range is the establishment of a "rocket range museum" on the former site of the SpacePort (Anonymous pers. comm. July 1999). The museum would be open year-round and provide tourists with an first-hand view of the aerospace industry.

In 25 years, the economic viability of this sector without the research range will be tied to the growth of small businesses in Churchill. The Chamber of Commerce is currently providing advice and expertise to some of the small businesses in Churchill. The Churchill Community Development Corporation (CCDC) is also helping out by providing $7,000 loans to business entrepreneurs (CCDC 1999). The expansion and implementation of the Churchill Community Development Corporation, Aboriginal Business Development Program, and Tourism Industry Loan Fund are allowing entrepreneurs a head start on business. Examples of possible businesses in the future scenario could be a haircutting salon, fitness gym or laundromat.

5.5.2 Environmental Components

The failure of the SpacePort industry in Churchill may have been a step in the right direction for the future environmental integrity of the Town. Although an environmental assessment was conducted for the SpacePort project, several key environmental concerns were not addressed (DNR 1999, Anonymous pers. comm. June 1999). One concern was the impact of the construction of a road that would have connected the SpacePort facilities. Another concern dealt with the storage and usage of a

potentially ecologically destructive chemical called hydrozine (Tetres 1997). Although the community did not reap the economic benefits of the SpacePort, an environmental accident may have been avoided (Anonymous pers. comm. July 1999).

5.5.3 Social Components

The community of Churchill has begun to realize that ill-conceived mega-projects are not the answer for sustainable development of the Town (Ernie Depatie pers. comm. July 1999). Small-scale projects that are initiated by local individuals may have more positive impacts on the social well-being of the Town in the future. Local initiatives may not only increase employment within the town, but also keep revenue and economic spin-offs within the community. The community believes that if they focus on self-sufficiency, as opposed to outside private funding, they may be better off in the future (Anonymous pers. comm. July 1999).

5.6 Social Development

The face of health care, education and community development may undergo many changes in the next 25 years. The health care system will continue to be one of the largest employment sectors, and education will be characterized by greater cultural sensitivity and community involvement. Moving toward a more sustainable community in the future scenario will require improved cooperation and communication between community members and social program providers (Anonymous pers. comm. July 1999).

5.6.1 Economic Components

The regionalization of the Churchill health centre in January 1996 will have implications for the future sustainable development of the community. Regionalization has provided Churchill with the opportunity to acknowledge the contribution of health

care services to the region (RHA Inc. 1999). It is becoming increasingly recognized that health services are a key component to the infrastructure of Churchill, which further attracts industry, trade and tourism to the community, providing economic benefits for everyone, as well as ensuring access to health services. For example, cooperative linkages are established with the Territory of Nunavut because of the health services provided by the Churchill RHA to Nunavut residents (NTCL 1999). From an economic standpoint, the RHA will need to explore, and priorize the potential for establishing strategic alliances, partnerships and sponsorships to generate revenue and leverage for program enhancement and expansion. The availability of new money and strategic planning may result in doctors and nurses remaining in the community for longer periods (RHA Inc. 1999).

The establishment of links between the RHA, Duke of Marlborough school, and the Keewatin Community College may serve to streamline the delivery programs for health and education in the future. The ability to share financial resources and work cooperatively to cut costs is a vital component for the sustainable development of the community (Brenda Wohlgemuth pers. comm. July 1999).

5.6.2 Environmental Components

One of the components of environmental integrity is the ability of a community to use waste products in continuous cycles (Roseland 1992). In Churchill, waste and refuse disposal has been a problem because of poorly planned landfills and inclement temperatures, which slow down the rate of biodegradation (Dredge 1992). The establishment of new businesses and expansion of tourism and shipping activities in the future may create even more waste in the community. Residents in the community and

Town Council have recognized that traditional approaches to waste disposal are no longer practical (Anonymous pers. comm. July 1999). A recycling program aimed at cleaning up some of the waste in the Town, and using more products in continuous cycles would help the community move toward sustainable development. The two traditional approaches to waste management – dumping and incineration, view waste as a liability and not as a potential asset. Many of the waste products in Churchill can be turned into valuable resources while reducing the solid waste stream. Examples of possible initiatives for Churchill are:.

1. Recyclable goods such as cans, bottles and paper can be collected and sold to industries that manufacture recycled goods. If collected goods can be sold to local industries (Thompson, Mb), benefits in the form of new jobs and local spending is generated.
2. Toxic wastes like paint, turpentine, and other household products can be collected and redistributed at community exchanges instead of being dumped.

5.6.3 Social Components

The level of population in this future scenario is closely linked to the success of the tourism and Hudson Bay Port Company activities. Although the population of Churchill has been decreasing steadily over the last few decades, expansion of tourism and shipping may serve to stabilize and even increase the population (Cory Young pers. comm. July 1999). Presently, many residents stay in Churchill only during peak tourism (Oct and Nov) and shipping seasons (July – Oct) and then return south for the remainder of the year. Tourism and shipping could increase population levels in the community through increased employment opportunities.

The Regional Health Authority may be taking a new stance toward community needs and health in the future (RHA Inc. 1999). In 1997 the RHA conducted a Health Needs Assessment that was aimed at identifying community needs, and assessing the key factors influencing the health of residents (RHA Inc. 1999). This research identified areas of concern and opportunity within the community. The following are priority areas identified in the study:

1. Alcohol and drug abuse;
2. Problems related to parenting;
3. Care for the elderly; and
4. Gambling addictions.

A new curriculum in the Duke of Marlborough school that incorporates Town history and aboriginal heritage may also be an important element of community sustainable development (Figure 16). Many respondents stated that students in Churchill are not excited to learn because the curriculum is not suited to their needs. In response to this concern, one individual is working on the implementation of a new curriculum that would incorporate practical learning experiences and aboriginal teachings (pers. comm. July 1999).

5.7 Backcasting to Identify Areas of Priority for Sustainable Development

This section identifies specific social, economic and environmental areas of priority for community sustainable development in the future. Areas of priority for sustainable development in Churchill are those components that either diminish or deplete the social well-being, economic viability or environmental integrity (Roseland

1992). These areas were identified by comparing the current situation in Churchill to the future sustainable scenario.

5.7.1 Economic Areas of Priority

1. One of the fundamental components of sustainable development is a community's level of self-reliance (Roseland 1992). The high level of seasonal employment decreases the community's level of self-reliance because residents are forced to rely on government and welfare subsidies for large portions of the year (Figure 17).
2. Improved coordination in the transportation sectors would mean that Churchill could take advantage of increased tourism dollars, and specialty crops through the Port (Alan Johnson pers. comm. June 1999). There have been many complaints over the last few years that the Port, VIA Rail and Calm Air do not provide adequate transportation service to tourists and shipping clients (Anonymous pers. comm. July 1999, Winnipeg Free Press August 5, 1999).
3. Increased aboriginal involvement in Churchill's economy would help the future economic viability of the population (Figure 17). Although 50% percent of the community is aboriginal, only about 5% of local businesses are aboriginal-owned and operated (Town of Churchill 1999).
4. An increase in shipment levels through the Hudson Bay Port Company would help to improve the economic viability of the Town because it would increase employment for the locals. The Canada Grains Council estimates that the HBPC must ship at least 600,000 tonnes to break even (1997). The Canadian

Grains Council also estimates that the HBPC must ship one million tonnes of cargo annually to be profitable in the long-term.

5.7.2 Environmental Areas of Priority

1. The removal of derelict military buildings and dumps would improve the environmental integrity of the Town. Several of these buildings contain asbestos and PCBs, which may contaminate the wildlife and groundwater (Figure 12). Public Works Canada and the Town of Churchill are actively trying to remediate these sites, but many contaminated sites still remain (Town of Churchill 1999).
2. Enforcement of regulations for tundra vehicles and ATVs that travel off designated routes would improve the environmental integrity of the Town because it would reduce their environmental impact (Figure 12)(Webb 1985). The Department of Natural Resources is concerned that permanent damage to the tundra by these vehicles may destroy the future viability of the environment and tourism industry (DNR 1999).
3. Limiting the amount of gravel excavation along the Hudson Bay coast would improve the environmental integrity of the Town. The presence of gravel pits can cause coastal erosion and destruction of wildlife habitat (Figure 12) (Dredge 1992). However, re-vegetation and remediation of these gravel pits is very expensive and time-consuming (Anonymous pers. comm. June 1999).
4. Churchill has been identified as an area that is highly sensitive to climate change (Stirling et al 1999). Impacts of global warming in Churchill include an increase in the number of ice-free days and reduced nutrition in polar bears

due to a shorter feeding season (Stirling et al 1999). If this warming trend continues in Churchill, it will impact not only the environment, but also the economic viability of the region. For example, polar bears may have to move further north to obtain an adequate food source, thereby causing a reduction in the tourism viability of Churchill (Stirling et al 1999, CBC 1999a)

5.7.3 Community Areas of Priority

1. Although Churchill has excellent education facilities, community responses suggest that the education system in Churchill does not adequately address the cultural diversity and unique needs of the community (Figure 15). High dropout rates have been prevalent in the school over the last few years. As one respondent mentioned, the inability to develop educated children will have negative impacts on the social well-being of the community (Anonymous pers. comm. July 1999).
2. The establishment of a long term health care facility would improve the level of care for the elderly. Today, the absence of such a facility, requires that residents travel south to receive proper care (Figure 15).
3. Providing more resources and social welfare programs for alcohol and drug abusers would contribute toward the social well-being of the community (Figure 15). Current manifestations of this abuse can be seen in the incidence of Fetal Alcohol Syndrome (FAS), crime levels, and parental neglect (RHA Inc. 1999).

Chapter 6

Summary, Conclusions and Recommendations

6.0 Summary

This study began in October 1999 in conjunction with the Department of Fisheries and Oceans. The purpose of this study was to develop a better understanding of the relationship between sustainable development and characteristics specific to northern coastal communities. The research began with a comprehensive review of literature concerning sustainable development, communities and evaluation frameworks. From June 24 to July 8, 1999, the researcher conducted interviews with stakeholders (N=54) in Churchill, in order to identify the community's perspectives on social well-being, environment and economy. On Friday September 3, the researcher traveled back to Churchill to confirm research results with the community. Analysis of the data involved a backcasting framework to link and analyze the literature and interviews from the perspective of sustainable development.

Sustainable development for coastal communities is a process that refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs (WCED 1987). Using Churchill, Manitoba as a case study, the researcher documented community perspectives and literature to establish what sustainable development meant for this small northern coastal marine community.

6.1 Conclusions

The objectives of this thesis identified in Chapter I were:

1. To document community perspectives on the social well-being, environment and economy of the Town of Churchill;
2. To review and analyze literature on Churchill's history, sustainable development, communities and evaluation frameworks;
3. To analyze community perspectives and development options from the perspective of sustainable development; and
4. Using Churchill as a case study, to draw conclusions and make recommendations concerning sustainable development for Canada's northern communities.

Objective 1: The researcher's fieldwork in Churchill provided a forum where respondents could express their views about the social, economic and environmental components of their community. The researcher facilitated a discussion directed at the most basic and shared concerns, experiences and recommendations for Churchill, which helped people look toward the future and recognize a common set of priorities. The residents of Churchill share the goal of maintaining and improving their quality of life. They share a focus, which goes beyond wage jobs and cash incomes and considers all factors affecting the well-being of residents in Churchill.

The community shares the goal of directing development to local needs. They also share an interest and respect for natural resources, and want to ensure that economic and environmental considerations are appropriately integrated in development plans. The community also shares the goal of bringing development decision-making closer to the people who live in Churchill. Sustainable development requires meaningful involvement

of local people in the decisions which affect them. The community wants to ensure that development decisions will sustain and enhance the quality of life for individuals into the 21st century.

Community responses also led to the development of concentric rings (Figure 22) illustrating annual social, environmental and economic activities. Figure 22 shows that a high percentage of activities (i.e. tourism and shipping) occur between the months of May through October. Accordingly, the highest levels of employment and income generation are restricted to these months. The development of tourism shoulder seasons and the expansion of shipping by the Hudson Bay Port Company may help the community to diversify the economy and generate economic growth.

Objective 2: The literature cited identified the need for sustainable development measurement techniques on the community level. Current literature pointed to the use of indicators as the most reliable method of measuring a community's progress toward sustainable development (SCIP 1999). The application of an indicator measurement program for Churchill was unsuccessful because of a lack of adequate historical and current social, economic and environmental data. A backcasting framework was found to be the best approach for evaluating sustainable development in Churchill because it allowed the researcher to incorporate qualitative data from community interviews and quantitative data from research and literature reviews. The backcasting framework concluded with a set of realistic and achievable goals for Churchill to move toward sustainable development.

Objective 3: This research has shown that sustainable development for Churchill may include:

a) A healthy economy that is based on NTCL resupply to Nunavut, tourism, shipping through the HBPC, and the RHA Inc. This economic base should in turn provide employment for local residents, rely on local strengths and resources and provide opportunities for generations to come;

b) A healthy environment that is based on healthy wildlife populations (polar bears, beluga whales), healthy terrestrial, aquatic and marine resources and a clean community. This environmental base should in turn provide clean air and water for local residents, and provide a base for tourism and economic development.

c) A healthy community that has strong health care (RHA Inc.), educational facilities (Duke of Marlborough, KCC), and social services. This community base should in turn provide community support for locals in the form of social support programs and recreation, foster cultural heritage, involve residents in community decision making and provide support for youths and elderly.

Objective 4: Northern communities are distinctive in comparison to their southern counterparts (Beals 1968, Dredge 1992). The history and lifestyle of people in these northern communities have given them a common identity, reflecting the climatic, geographical and natural conditions in the arctic and sub-arctic (Dredge 1992). Today, living in these communities means dealing with unique problems, challenges and solutions in day-to-day life. Despite its vast size and remoteness, this area shares many social, economic and environmental characteristics. These communities are located in the north, are generally very small and remote and usually have a majority or

predominant aboriginal population. Northern communities are heavily influenced by the government because of the structure of jurisdictions and authorities in the north and because of the substantial contributions of social assistance and influence of external investment decisions on the regional economy (McTiernan 1999).

The environmental, social and economic issues identified in this study may be similar to concerns in other northern communities in Canada. From an environmental perspective, global warming is a concern that may have environmental impacts not only on Churchill, but the rest of Canada's arctic and sub-arctic communities (Stirling et al 1999). Examples of possible impacts include a reduction in polar ice, increased flooding and an increase in severe weather events (CBC 1999a). From a social perspective, the prevalence of alcohol abuse may be another shared concern among northern communities. In the case of Churchill, alcohol abuse was identified as the most serious health-related problem in the community (RHA Inc. 1999). From an economic perspective, the issue of diversifying economies through tourism expansion is not only an issue in Churchill but in many of these northern communities. These communities are drawn to this type of economic development because it offers a relatively small capital, non-consumptive economic approach (Boo 1990). Tourism in northern communities has taken the form of sport fishing, sport hunting, camping, wildlife viewing, and hiking.

Increased awareness of these issues in some northern communities has contributed to an understanding about issues concerning sustainable development. This increase is reflected in the attention given by municipal councils and community advisory groups to waste management, water quality, and local employment opportunities (NMEDC 1993). There is also a growing attention in the non-aboriginal northern

community to the value of many of the traditional practices and beliefs of aboriginal elders (McTiernan 1999).

Although Churchill has a number of unique characteristics, many of the issues and concerns may be similar to those experienced in Canada's other northern communities. There is a clear need to identify opportunities and promote local economic, environmental and social development to reduce poverty, improve education and strengthen cultural identity in local northern residents. The north is endowed with rich resources and only partially exploited possibilities. A mobilization of resources and broad co-operation among stakeholders is essential to address adequately the multiple challenges in the north.

6.2 Recommendations

6.2.1 Develop a Sustainable Development Action Plan

The Sustainable Development Action Plan is a set of steps that Churchill or any other northern community can use to operationalize sustainable development in their community. The following points are rigorous enough to ensure on-the-ground results, yet flexible enough that they can be adapted to any existing community planning process.

1. Create a Community Network: A community network consists of groups and individuals, which share a common desire of moving along the path of sustainable development (Lovel and Feuerstein 1992). It could include both groups that are actively working on projects as well as ones that are interested in offering their support. The network should include community groups (CCDC), schools (Duke of Marlborough, Keewatin College, CNSC), community leaders, and the municipal government.

2. Set up a Coordinating Committee: A sustainable development action coordinating committee could be made up of representatives from all sectors of the community, who have agreed to help promote and support community-based projects.
3. Select a Community Coordinator: It is necessary to find a contact person who can support the coordinating committee and the community network and provide a link to the provincial and federal support programs. The coordinator could be a municipal staff person, someone in a contract position with a community group, consultant, or volunteer.
4. Identify Sustainable Development Priorities: Sustainable development priorities are identified in this research, and could also be added upon by the community network. Examples of sustainable development priorities for Churchill include recycling programs, restrictions on tundra vehicles, and community involvement in decision-making.
5. Create a Sustainable Community Action Plan: The Sustainable Community Action Plan is a brief document which states the sustainable development priorities for the community, the lead organization for each issue and some of the projects which will support the community goals. The document can be a separate publication or published through a community newspaper. The coordinating committee may want to hold a public workshop at the beginning of the process, and also review the draft action plan.
6. Organize Community Campaigns: The coordinating committee or any of the participating organizations can use the community network to develop a community-

wide campaign in support of an overall sustainability goal. An example of a campaign for Churchill is community-wide garbage and recycling pickup.

6.2.2 Develop and Enforce Tundra Vehicle and ATV Regulations

At present, there are no explicit guidelines available to users of off-road vehicles in Churchill. Based on information provided through literature reviews and interviews with the community, guidelines should include:

1. Designated routes for both ATVs and tundra vehicles, which adhere to existing routes from former military use and past developments.
2. Those operators, who have tundra vehicle permits, should donate a percentage of their revenue to ecological research on vehicle impacts.
3. Regulations should also be developed for other off-road vehicles, such as hovercraft, sport utility vehicles, etc.
4. Guidelines for vehicle use should be easily accessible in the Town.

6.2.3 Create a Tourism Operational Organization

A tourism organization should be established to effectively design and implement a tourism strategy to maintain or increase the future level and quality of tourism in Churchill. This organization should include all the tourism operators, as well as representatives from the federal government (Parks Canada, Transport Canada, Tourism Canada, Canadian Wildlife Service), Manitoba government (Department of Industry Trade and Tourism, Travel Manitoba, Manitoba Development Corporation), the Town of Churchill, Chamber of Commerce, and other entrepreneurs.

6.2.4 Develop Tourism Shoulder Seasons

The peak tourism seasons between the months of May through November attract thousands of visitors and generate millions of dollars in local revenue (Town of Churchill 1999). However, the average tourist stays in the community for a relatively short time in comparison to other tourist destinations (MacKay 1999). If a wider variety of activities were developed within these months, these same visitors might stay longer, thus increasing their expenditures in Churchill. Additional summer activities could involve overland trekking (day and overnight trips), ecology tours, and Hudson Bay voyages. Overland treks could take place on the westside of the river, to include Sloop's Cove and Fort Prince of Wales; on the eastside of the river to include a tour of town and inland and coastal routes to Twin Lakes. Bay voyages could be for fishing and camping purposes north of Churchill.

Fewer tourists visit Churchill between the months December through April because of harsh winter weather and the absence of popular wildlife (Dredge 1992). Development of smaller tourism and economic ventures during this period might include dog sled/snowmobile trips to Eskimo Point, conferences, aurora borealis viewing, school exchanges, and hockey tournaments.

6.2.5 Implement Integrated Management

The implementation of Integrated Management under the *Oceans Act* (1997) could help the community move toward sustainable development. Integrated management is an ongoing and collaborative approach, which brings together interested parties to incorporate social, cultural, environmental and economic values in the development and implementation of comprehensive plans and management processes

(DFO 1999d). This framework could provide for the establishment of a Marine Protected Area (MPA) along the Hudson Bay coast and the establishment of management plans for activities in or affecting Hudson Bay.

6.2.6 Implement Indicators Program

The implementation of an indicators program (i.e. SCIP) may be a valuable step toward sustainable development. The development of an indicators program would enable the community to select and monitor specific social, economic and environmental trends in the community. The Sustainable Community Indicators Program (SCIP) would be a valuable tool in this process because it is a software package that is user-friendly and practical.

6.2.7 Apply Backcasting to other Northern Communities

The backcasting approach used in this study could be used in other northern communities to identify concerns and build consensus on issues affecting the environmental, social and economic livelihoods of northern communities.

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Winnipeg Free Press, "Airport lands $1.9 million facelift," June 19, 1999.

Winnipeg Free Press, "Shortage of seats on train leaves 24 stranded," August 5, 1999.

Winnipeg Free Press, "Sayisi Dene recall life in the 'Biggest Slum,'" October 5, 1999.

Winnipeg Free Press, "Pea shipment may open new era for Churchill," October 6, 1999.

Winnipeg Free Press, "Grain Handling report slammed," October 7, 1999.

Winnipeg Free Press, "Competition key to grain reform," October 12, 1999.

Winnipeg Free Press, "The Northwest Passage Thawed," February 5, 2000.

Personal Communication

1. Mike Macri, Sea North Tours, July 1999
2. Brenda Wohlegemuth, Churchill Regional Health Authority, July 1999
3. Cory Young, Town of Churchill, July 1999
4. Helen Fast, Department of Fisheries and Oceans, November 1999
5. Alan Johnson, Hudson Bay Port Company, July 1999
6. Ernie Depatie, Parks Canada, July 1999

Appendix 1: Interview Schedule for Community Stakeholders in Churchill, Manitoba

Section 1: Characterization of the Subjects

1. What is your name, age, address and phone number?
2. How long have you lived in Churchill?
3. Do you have family members that live with you in Churchill?
4. What is your current employment status?
5. How many jobs have you held in the last year?

Section 2: Environmental Issues in Churchill

6. What do you see as the main environmental issues in Churchill now, and what will they be in the next 10 years?
7. What, if any, changes in the environment have you noticed since you have lied in Churchill?
8. What activities do you think have contributed to the present environmental situation?
9. How do you feel global warming will influence the environment in Churchill, and is climate change a concern to you?
10. What are important indicators of a sustainable (healthy) environment?
11. What recommendations would you make for a more sustainable environment?

Section 3: Economic Issues in Churchill

12. What do you see as the main economic issues in Churchill now, and what will they be in the next 10 years?
13. Are you optimistic about the future viability of the Port of Churchill?
14. Are you optimistic about the future viability of the Research Range?
15. Will the establishment of Nunavut have any impact on the economy of Churchill?

16. Churchill's population has historically experienced a steady decline, what number of people do you think is ideal for the town?

17. What are important indicators of a sustainable (healthy) economy?

18. What recommendations would you make for a more sustainable economy?

Section 4: Social Issues in Churchill

19. What are the most important social issues in Churchill now, and what will they be in the next 10 years.

20. What do you feel are important indicators of social well-being in Churchill?

21. Do you think there is a future for the youth and children in Churchill? If yes why? If not, why not?

22. What recommendations would you make to improve the social well-being of the community?

Appendix 2: Community Respondents in Churchill, Manitoba	
Name	**Department 1**
Alan Johnson	Hudson Bay Port Company
Allan Chapman	Cree
Bill Erickson	Boreal Projects
Bonnie Chartier	Churchill Wilderness Encounters
Brenda Wohlgemuth	Churchill Regional Health Authority
Bruce Andrews	Churchill Marine Tank Farm Company
Mike Boudreau	Town of Churchill Maintenance
Carolyn Bjorklund	Dene
Claude Liboiron	Northern Transportation Company Limited
Connie Breen	Churchill Community Development Corp.
Cory Young	Town of Churchill
Dan Longboy	Churchill Northern Studies Centre
David Casky	Alliance Church
Dean Pawulski	Calm Air
Doug Clark	Parks Canada
Barbara Gordon	Town of Churchill Maintenance
Dwight Allen	Polar Inn/White Whale Lodge
Ernie Depatie	Manitoba North National Historic Sites and Wapusk National Park
Eva Trelour	Northern Transporation Company Limited
Gavin Lawrie	Aurora Inn
George Kopek	Right Way Recyclers
Warren Bernhardt	North South Consultants
Greg Lundie	Parks Canada
Harvey Lemelin	Churchill Northern Studies Centre
Jack Batstone	Parks Canada
Jean-Francois Thibault	Kayaks and Belugas
Jo-anne St. Godard	Culture, Heritage and Recreation
Joe Spence	Teenager, Student
Juliette Lee	Town of Churchill
Laurie Guyot	Parks Canada
Len Smith	Tundra Buggy Tours
Lori Gagnon	Churchill Business and Professional Women's Club
Lorraine Brandson	Eskimo Museum
Marilyn Wolkoski	Great White Bear Tours, Inc.
Mark Elyk	Royal Bank
Mark Ingerbrigtson	North Star Tours
Michael Spence	Town of Churchill
Mike Macri	Sea North Tours
Monica Friesen	Royal Bank
Myrtle DeMeulles	Metis Federation
Nicole Firlott	Churchill Northern Studies Centre
Parker Fitzpatrick	Manitoba Hydro
Paul Ratson	Adventure Walking Tours
Paul Watts	Churchill Regional Centre
Penny Rawlings	Arctic Trading Post
Peter Scott	Churchill Northern Studies Centre
Rhonda Reid	Churchill Northern Studies Centre
Rob Pritchard	Royal Canadian Mounted Police
Sheldon Olivier	Adventure Walking Tours
Steve Miller	Hudson Bay Helicopters Limited
Tony Desilva	Gypsy's Bakery/Trader's Table
Valerie Daly	Wapusk General Store