

**THE ROLE OF GOVERNANCE AND KNOWLEDGE SYSTEMS IN
ADAPTATION TO CLIMATE CHANGE IN HOPEDALE, NUNATSIAVUT**

A Thesis

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The Faculty of Graduate Studies

of

The University of Guelph

by

LAURA LEE FLEMING

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ABSTRACT

THE ROLE OF GOVERNANCE, INSTITUTIONS AND KNOWLEDGE SYSTEMS IN ADAPTATION TO CLIMATE CHANGE IN HOPEDALE, NUNATSIAVUT

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University of Guelph, 2009

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This thesis assesses the role of governance and knowledge systems, including formal and informal institutions in the process of adaptation to climate change. Based on an assessment of vulnerabilities in the community of Hopedale, Nunatsiavut, this research identifies and describes the influence of institutions and systems of knowledge and governance pertaining to natural resource management in Hopedale, across multiple levels, in facilitating or constraining adaptive capacity to deal with climate change. Institutions and governance systems provide Hopedale residents with capacity to deal with climate and other changes, through their representation in natural resource management decision making arrangements such as the Torngat Management Boards as a result of the Labrador Inuit Land Claims Agreement. Other interactions within and between these institutions such as the differences in governance approaches between Nunatsiavut and Provincial institutions have the effect of hindering or reducing capacity. Ultimately, the interactions and processes within and across institutions and systems of governance play an important role in the process of enhancing adaptive capacity and reducing Hopedale residents' vulnerability to climate and other change.

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This thesis is dedicated to the memory of my friend, Brenda Ann Healey.

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LIST OF ACRONYMS

ACIA - Arctic Climate Impact Assessment

AHDR- Arctic Human Development Report

HSP - Hunter Support Program

IBA- Impact and Benefit Agreement

ICG - Inuit Community Government

IPY - International Polar Year

IPCC- Intergovernmental Panel on Climate Change

ITK- Inuit Tapiriit Kanatami

LIHC- Labrador Inuit Health Commission

LIK- Labrador Inuit Knowledge

LIL - Labrador Inuit Lands

LILCA - Labrador Inuit Land Claims Agreement

LISA - Labrador Inuit Settlement Area

NG - Nunatsiavut Government

NAO- North Atlantic Oscillation

TEK – Traditional Ecological Knowledge

CHAPTER ONE

INTRODUCTION

1.1 Research Problem

Climate change is a reality in the Canadian Arctic. In light of the widely recognized implications of climate change, adaptation is becoming increasingly necessary for resource-based communities within the Arctic. Conclusions from the 2007 Intergovernmental Panel on Climate Change (IPCC) Report confirm the impacts of climate change and the imminent implications for communities in Arctic Regions. These IPCC and similar forecasts of future implications of climate change are prompting many important questions. One of these questions is how communities in the Arctic are going to manage adapting to current and projected environmental changes, particularly in Inuit communities currently experiencing a number of changes in their social, cultural, political and economic systems (Nickels *et al*, 2006; ACIA, 2004; Ford *et al*, 2007).

Climate change literature suggests that adaptation and capacity building to deal with climate change occurs through multi-level institutions which span individual, household, community and regional levels (Keskitalo, 2004; Koch *et al*, 2007; Wilbanks & Kates, 1999). Due to the local and context specific nature of climate change experiences and impacts, adaptation initiatives and strategies ought to appropriately reflect the distinct characteristics of communities and be mainstreamed or developed into existing management initiatives (Huq *et al*, 2003; Smit & Pilifosova, 2003). Understanding the nature and structure of the dualistic Inuit and Western oriented institutions that characterize governance in the Arctic is becoming recognized as important throughout related climate change literature (Næss *et al*, 2005; Armitage, 2008).

Further, the capacity and dynamics of the formal and informal institutional networks and governance systems that will be called upon to facilitate the process of building capacity to adapt to climate change also require further attention. There is a need to address these emerging questions regarding the practicalities of implementing adaptation initiatives and interventions that seek to enhance capacity and reduce a community's vulnerability to climate change. Of particular concern, as it has been identified within this thesis, is the ambiguity regarding the role of distinct Inuit and western scientific knowledge systems and worldviews which intersect within Arctic governance structures, and how these differences will be considered within adaptation initiatives that deal with climate change. This thesis therefore explores the role of multi-level governance, institutions and knowledge systems in facilitating adaptation to climate and other changes in an Arctic context.

There remains a research gap regarding understanding how institutions and governance structures facilitate or constrain adaptation and adaptive capacity (Turner *et al*, 2003). Although there is an increasing understanding of expected impacts of environmental change and increasing recognition of the need for adaptation in the Arctic (Stroeve *et al*, 2004; Berkes & Jolly, 2001; Smit & Pilifosova, 2003). There is little research to date focused on how adaptation strategies or plans are to be undertaken in light of the related governance structures and knowledge systems (Cash & Moser, 2000; Cash *et al*, 2006). The significant implications of climate change predicted for the Arctic present a need in particular for research that seeks to understand the role of governance systems in the Arctic with regard to enhancing adaptive capacity and facilitating adaptation. This thesis has been designed to begin to address these challenging research issues in the context of an Arctic community.

1.2 Research Aim & Objectives:

The aim of this research is to identify and describe the role of governance, institutions and knowledge systems, specifically Labrador Inuit Knowledge, in undertaking adaptation to climate change in Hopedale, Nunatsiavut.

Consistent with this overall aim, the objectives of the research are to:

1. summarize current social-political-economic and environmental vulnerabilities to climate change in the community of Hopedale, Nunatsiavut;
2. document the existing governance structures and systems pertaining to the above identified vulnerabilities;
3. describe and explain the role of knowledge, specifically Labrador Inuit Knowledge, including opportunities and limitations, within these governance systems;
4. identify opportunities to enhance adaptive capacity to deal with climate change based on existing systems of governance.

For the purposes of this research, a number of key terms have been adopted from various bodies of literature and are referred to throughout this thesis. The concept of governance is understood here as “...the development and application of the principles, rules, norms, and enabling institutions that guide public and private interactions...” (Armitage *et al*, 2008). The related notion of institutions involves “...the formal and informal norms, rules, discourses, principles, and decision-making procedures that influence interactions between participants in an issue or problem area...” (Clark *et al*, 2002). Throughout this thesis, both formal and informal types of institutions are considered. Formal institutions can include a range of organizations, agencies, departments, governments, ministries, laws, constitutions and regulations for example. Informal institutions can be generally understood as the ways of organizing activities (Dietz *et al*, 2003), often within a community or group of people. Informal institutions are also interpreted as a form of social

capital or a means of accessing resources or networks within a community or region (Agrawal, 2008).

More specifically, informal institutions are the expectations, behaviours, rules, norms and principles that shape the interactions amongst humans and between humans and their environment (Ostrom, 2005).

Within these institutions both formal and informal, various stakeholders play a role in shaping the nature of the institutions.

Stakeholders are expressed here as:

...any group of people organized or unorganized, who share a common interest or stake in a particular issue or system...at any level or position in society, from global, national and regional concerns down to the level of household or intra-household and be groups of any size or aggregation... (Grimble & Wellard, 1997:175).

The term Labrador Inuit Knowledge is also cited considerably throughout this thesis. This term is related to the broad concepts of indigenous knowledge, traditional knowledge, traditional ecological knowledge (TEK) and local knowledge. Broadly interpreted throughout natural resource management literature, the notion of indigenous knowledge is understood as a reflection or component of a unique knowledge system associated with 'indigenous' people (Berkes, 1993; Nadasdy, 2003). Similarly, traditional knowledge is often but not exclusively associated with indigenous peoples and refers to an historic understanding or storage of knowledge usually regarding the environment that is held by a group of people which has been passed down through generations. Traditional ecological knowledge or TEK as it is also referred to as, is described by Huntington (2000) as "knowledge and insights acquired through extensive observation of an area or a species...(and) may include knowledge passed down in an oral tradition, or shared among users of a resource (and that)...holders of TEK need not be indigenous". TEK is therefore as a component of indigenous knowledge but also is related to traditional knowledge. Local knowledge is similar to these concepts, though is not always associated with either indigenous or traditional knowledge, but is a system of knowledge that

emerges from a level of familiarity with a particular local or location and does not necessarily involve knowledge that has evolved over generations but can be recently acquired or evolving knowledge. The term Labrador Inuit Knowledge is also related to these concepts. Labrador Inuit Knowledge is defined in the Labrador Inuit Land Claims Agreement (LILCA) as:

“the knowledge, understanding and values held by Inuit based on personal observation, collective experience and oral transmission over generations” (LILCA, 2005:117).

Similar to TEK, indigenous and traditional knowledge, Labrador Inuit Knowledge is acquired over time through generations and is based on experiences of a particular group of people; Inuit. Unlike TEK however, Labrador Inuit Knowledge as defined by the LILCA, is not specific to ‘ecological’ knowledge. Further, Labrador Inuit Knowledge is not defined only by knowledge or information, but extends into a specific *understanding* and *value* base that is common to Labrador Inuit. Frideres & Gadacz (2008) explain that Inuit, similar to other distinct groups with a unique language and culture, have a specific worldview or ‘cosmology’, which shapes the behaviour and thinking of the individuals that belong to, or identify with that group. Hence, it is understood that Inuit have a worldview that is distinct from worldviews of non-Inuit. Given the context of this research, it is necessary to acknowledge this distinction in terms of understanding how it will or will not manifest in climate change adaptation in the Arctic (Bates, 2007; White, 2005).

1.3 Thesis Organization

This thesis is organized into seven chapters including this introductory chapter. The purpose of the first chapter is to outline the research purpose, provide a rationale for the research, as well as introduce the main research question, aim and objectives. Following this, chapter two provides the broader context of this research and related bodies of literature pertaining to the

scope of this topic. The second chapter provides a guide for the underlying framework that has shaped this research. Chapter three provides the rationale for the selection of Hopedale as the study site location and includes a description of the pertinent historical and biophysical attributes of the study area. Chapter four outlines and explains the methods used to collect and analyze the data set and justification for the use of those methods in this research. Chapters five and six reveal the major research findings. Chapter five includes the community vulnerabilities as well as existing capacities and constraints at the community level to manage these stresses. Chapter six explores the structure and role of governance, institutions and knowledge systems from local to regional and national scales, as they pertain to enhancing adaptive capacity to deal with the identified vulnerabilities. Finally, chapter seven summarizes the key findings as they pertain to the four main research objectives and discusses the practical and scholarly contributions of this research. The following section begins with a comprehensive review of the related bodies of scholarship that shaped this research including the topics of governance, knowledge and adaptation to climate change in the Canadian Arctic.

CHAPTER TWO

RESEARCH CONTEXT

2.1 Climate Change in the Arctic

Global climate change is apparent in the Arctic. Despite scepticism and uncertainty of the past two decades, the climate science community has come to a consensus that the globe is now experiencing the beginning of expected impacts of climate change (Anisimov *et al*, 2007). The recent experiences and observations of the Inuit in the Canadian Arctic are of particular concern (Nickels *et al*, 2006; Ford *et al*, 2006; ACIA, 2004). The impacts currently experienced include temperature increases (Anisimov *et al*, 2007), sea ice melt (Stroeve *et al*, 2007), increasing instances of storms (Hurrell *et al*, 2003), localized precipitation changes (Rosenzweig *et al*, 2007), sea level rise and storm surge increases (Anisimov *et al*, 2007). Future impacts are expected to come in the form of increasing severity and frequency of storms and increasing rates of both sea ice melt and sea level rise (Zhang & Walsh, 2006). While mitigation efforts are being pursued, the projected impacts of climate change in the Arctic in particular highlight the need for greater attention on adaptation initiatives to enhance capacity and manage the projected change (Fankhauser *et al*, 1999; Anisimov *et al*, 2007).

Over the past two decades, a great deal of research has emerged with the aim of understanding primarily the biophysical and geophysical processes of climate change, and ultimately, how they will impact ecosystems and to a lesser extent, human populations. Increasingly, attention is being paid to the determinants of human beings' and communities' ability to cope with the current and anticipated changes of global climate change (Ford *et al*, 2007, Smit & Wandel, 2006). Communities in the Arctic have been identified

as highly sensitive and vulnerable to environmental change (Rosenzweig *et al*, 2007), and are now viewed as the climate change barometers for the rest of the world (ITK, 2007). Analyzing how communities within the Arctic are vulnerable or sensitive to changes has become pertinent to understanding what strategies will need to be employed to adapt to and cope with the impacts of environmental change (Kelly & Adger, 2000; Burton, 1997; Turner *et al*, 2003). In order to design and implement appropriate adaptation and capacity enhancing strategies, an understanding of the structure and dynamics of the institutions and governance systems that will facilitate adaptation initiatives is needed (Adger, 2003; Adger, 2005; Folke *et al*, 2005). The following section assesses several bodies of scholarship related to the topic of adaptation to climate change in the Arctic and the role of governance, institutions and knowledge systems. A number of bodies of literature are drawn upon including the biophysical impacts of environmental change, socio-economic changes in Arctic communities, adaptation and adaptation policy as well as institutions, stakeholders, governance and knowledge systems. Each will be considered with respect to how they have framed and guided the research process. The final section of this chapter discusses the research need that led to the development of this thesis. This begins with an overview of the many climate change influenced biophysical changes taking place across the Arctic region.

2.2 Biophysical Dimensions of Environmental Change

Fluctuations in global temperatures are normal biophysical processes which have taken place over several millennia. In recent decades, however, global average temperatures have extended beyond levels of natural historic variability (Rosenzweig *et al*, 2007; ACIA 2004). Increases in annual temperature are now averaging one degree Celsius with projections as high as 1.4 to 5.8 degrees Celsius by 2100 (ACIA, 2004). Anthropogenic climate warming is

attributed to an increase in human use of fossil fuels which have resulted in an unprecedented increase of carbon dioxide in the atmosphere and numerous biophysical changes to natural ecosystems (ACIA, 2004; Rosenzweig *et al*, 2007). Mitigation efforts to reduce carbon emissions are underway. However, global emissions are expected to continue to increase above natural levels for centuries even if mitigation efforts reduce current emission levels (ACIA, 2004). Even with the implementation of mitigation measures, climate change impacts are expected to continue for many decades (Anisimov *et al.*, 2007). Environmental change has been a process that communities, particularly Inuit communities across the Arctic, have coped with and adapted to over several millennia. The extent and degree of change anticipated for the Arctic however represents change which will extend beyond existing coping capacities of these communities. Adaptation to environmental change in the Arctic is inevitable (Smith, 1997; Anisimov *et al.*, 2007).

The reality of changes in biophysical processes and systems is becoming apparent worldwide, but particularly in the Polar Regions (ACIA, 2005; Nickels *et al.*, 2006). Notable changes have been experienced by the Inuit in Arctic Canada for at least the past ten years (ACIA, 2005; Ford *et al*, 2005; Laidler, 2006; Nickels *et al*, 2006). These changes have been documented and measured through a number of biophysical indicators including but not exclusive to, sea ice melt, sea level rise, melting permafrost, shorter winters and increasing frequency and severity of storms. Scientific evidence along with Inuit knowledge and observations confirm many predictions of environmental change impacts proposed in the first session of the IPCC (1997; Berkes & Jolly, 2001; Ford *et al*, 2006; Fox, 2002).

Sea ice melt is one of the most concerning and visible changes of global climate change. Recent studies reveal sea ice melt is occurring up to three times faster than predicted (Stroeve *et*

al, 2007), with decreases in sea ice extent by up 15 percent since the 1950's (Rosenzweig *et al*, 2007). The melting of sea ice has significant implications for marine wildlife and habitat such as for polar bears and seals (ACIA, 2004). Sea ice acts as the necessary platform from which polar bears hunt for food sources, and the loss of stable sea ice is already affecting their ability to locate and seize sources of food (ACIA, 2004). Ultimately these changes in sea ice also affect resource based communities in the Arctic who depend upon both the sea ice and the marine wildlife to maintain their livelihoods.

Sea level rise is a concern for most coastal communities in Canada, particularly those on the eastern coast (Zhang *et al*, 2000). The rate of sea level rise has increased dramatically within the last decade, rising approximately 1.8 mm/year to now upwards of 3mm/year (Rosenzweig *et al*, 2007). Coastlines are not only impacted by rising sea levels, but also increasing wave energy and impact from storm surges (Stieve, 2004). With all but one Inuit community in the Canadian Arctic situated on the coast, the impact of rising sea levels on Inuit communities is only beginning to be realized (Nickels *et al*, 2006).

With an increase in average temperatures, permafrost layers are weakening in a number of regions in the Arctic (Couture *et al*., 2002; ACIA, 2004). Top layer permafrost temperatures have increased by up to 3 degrees (Rosenzweig *et al*, 2007). Permafrost melt is contributing to coastal erosion on arctic shorelines which has significant and costly implications for the communities and infrastructure situated on weakening permafrost (Beaulieu and Allard, 2003). These changes represent but a few examples of the biophysical changes currently taking place in the Arctic today which continue to be measured and monitored extensively throughout the region.

While a great deal of research is currently being pursued to validate and monitor the changes occurring in ecosystems in the Arctic, less focus has been on how individuals and communities in the Arctic are and will be affected by these changes. Recent research indicates significant challenges for Inuit communities in the Arctic (Ford *et al*, 2005; Nickels *et al*, 2006; Anisimov *et al*, 2007). As resource-based communities that rely to a great extent on the land for sources of food and income generation, changes to the conditions of the environment have an impact on the ability of Inuit to maintain livelihood sustainably and cultural integrity (Young, 2004; ACIA, 2004). The nature of these changes for the Inuit, however, has received less attention in the literature, as has understanding how such communities will respond to and cope with the changes in environmental conditions.

2.3 Social-economic Change in the Arctic

In addition to climate related change, parallel changes to socio-economic and political realms of Arctic Inuit communities have been occurring for some time (AHDR, 2004; Laidler, 2006; Anisimov *et al.*, 2007; ACIA, 2004; Nickels *et al*, 2006). Ford and others (2005) highlight that indeed, many socio-economic linkages exist between Inuit and the environment and this is due to the historical relationship of the Inuit and the land and sea. Inuit communities are resource based with intricate socio-economic and cultural ties to the natural environment (AHDR, 2004; Collingnon, 2006). Considering the extensive use of ecosystems in resource-based communities, these groups will continue to be significantly affected by the impacts of environmental change in future (AHDR, 2004; ACIA, 2004).

Biophysical changes related to climate change are already having significant social and economic implications for Inuit communities (Communities of Labrador *et al*, 2005; ACIA,

2004). Permafrost melt is contributing to costly infrastructural damage to buildings, roads and pipelines (Couture *et al.*, 2000). Inuit rely on land and sea wildlife for hunting sources of *country food* and annual income (Ford *et al.*, 2006; Fox, 2002). Unprecedented changes in biophysical conditions are interfering with and compromising the applicability of Inuit knowledge of the environment (Nickels *et al.*, 2006; Ford *et al.*, 2004). This interruption in knowledge transmission is also affecting cultural integrity amongst Inuit communities as elder generations' knowledge has less relevance for the next and future generations. In addition to those changes, fewer youth are engaging in traditional activities. With the decline in time spent on the land participating in traditional hunting and harvesting activities amongst youth, as compared to their Inuit elders, a cultural shift is taking place within Inuit communities (Nickels *et al.*, 2006; Ford *et al.*, 2006; Laidler, 2006).

Impacts are also currently experienced in the form of increasing costs associated with travel. With reduced stability of sea ice, Inuit hunters are faced with more dangerous travel to hunting and fishing areas and risk loss or damage to snow machines. Hunters also travel further to avoid dangerous pathways on sea ice thus incurring more fuel costs (Ford *et al.*, 2007). Changes in permafrost strength due to warming temperatures is also contributing to costly infrastructure failure particularly for buildings located along shorelines and also subject to storm surges (Nickels *et al.*, 2006; AHDR, 2005; Anisimov *et al.*, 2007).

Sea ice melt has potential social and economic outcomes for Inuit communities in the form of increased navigability of the Beaufort Sea and the Northwest Passage. With potentially increased traffic due to tourism for example, there is an acknowledgement of possible future economic opportunities and subsequent impacts on social development (Eagles, 2004). Also related are concerns of sovereignty as new pathways for shipping and trade routes open up

(Rosenzweig *et al*, 2007). As most Inuit communities are situated on the shorelines in Canada, there is a likelihood that such changes in sea travel will affect Inuit communities as well (Nickels *et al*, 2006). The impact that increased tourism and sea transport within the Arctic will have on Inuit communities is, however, not yet fully understood.

Concern regarding the experiences of climate change in communities across the Arctic is enhanced by the reality of persistent non-climatic changes and stresses. These other changes are manifested in the form of changing political regimes, loss of culture, knowledge and language, high costs of living, scarce employment and income, health concerns such as diabetes, suicide and drug and alcohol addiction (AHDR, 2004; Nickels *et al*, 2006). It has been suggested that changes in the environment are simply exacerbating ongoing socio-cultural and political stresses and challenges common to Inuit communities across the Arctic (AHDR, 2004; ITK, 2007; Nickels *et al*, 2006). It is apparent in the literature that these socio-economic and political dynamics are often overlooked or assumed to be homogenous when assessing impacts of environmental change on Inuit communities. While many Inuit communities in the Canadian Arctic are experiencing these changes, they are being experienced differently within each region, and each community. This thesis therefore has adopted a deliberately broad, multi-scale approach to assess and understand how these underlying dynamics, as well as others, such as governance structures and dynamics, influence and contribute to a community's ability to cope and respond to stresses.

2.4 Theoretical Context & Research Framework

Three overarching theoretical approaches guide the scope and framework of this research. These include political ecology, vulnerability and institutional analysis of socio-economic

systems. Central to the entire research project, a community-based, collaborative approach is employed. These theoretical and empirical approaches are effective for the purposes of this research to ensure the centrality of the community priorities throughout all phases of the research process. Political ecology and the vulnerability approach both provide a necessary theoretical basis that places the context of this research into its broader framework regarding climate change and adaptation. Borrowing from the institutional analysis and resource management scholarship provides this research with a framework to navigate the governance, institutional and knowledge systems aspects of this research.

2.4.1 Political Ecology

Political ecology draws on several disciplines including geography, political science, ethnography, anthropology, sociology and history to understand the complexities of human-environment relationships (Robbins, 2004; Berkes *et al.*, 2003). Peterson (2000) defines political ecology as trans-disciplinary and an approach which seeks to “...integrate natural and social sciences approaches to understanding the relationships between human and ecological systems...” This approach considers the possible political, social and economic influences in its analysis of human-environment relationships and conflicts (Watts and Bohle, 1993; Bohle *et al.*, 1994; Kasperson and Kasperson, 2001; Berkes *et al.*, 2003; Turner *et al.*, 2003).

Berkes *et al* (2003) highlight how political ecology draws attention to the various actors with different perspectives and interests and how these span across various geographic scales. Contributions by Amartya Sen (1981) on the entitlements theory which employs a political ecological analysis provide further context for this approach. Sen’s work on famines illustrates how a political ecological framework enriches our understanding by shedding light on the

institutional, social, political and economic barriers that can exacerbate vulnerability (Kasperson and Kasperson, 2005). Building on this seminal piece, Kasperson and Kasperson (2005) identify the work of Leech et al (1999) on deforestation in the Sahel as an illustration of the role that “...interacting and overlapping institutions, both formal and informal ...embedded in the political and social life of an area...” have on the degree of vulnerability of individuals. Political ecology brings to light the many complex societal and economic factors that factor into human – environment interactions.

A limitation of political ecology however, is the emphasis on the human dimension of such relationships and the limited framework of analysis that focuses on the ecological dynamics of these relationships (Peterson, 2000). In the context of climate change, it is feasible that broad application of the principles of political ecology inadvertently may overlook the significance of the interrelationships between communities and the environment, particularly in the case of the Inuit who are intimately culturally, economically and historically tied to the environment (Collingnon, 2006). Without adequate consideration for the role of biophysical and environmental dimensions within human-environment interactions, political ecology leans heavily towards the human end of analysis in human-environment relations.

Political ecology is an approach that acknowledges and attempts to understand the social, economic and political factors that influence and explain human-environment systems and interactions. This theoretical approach is useful in the context of this research as it aims to understand the unique nature of institutions and organizations and their interrelationships (Armitage 2008). In addition, political ecology recognizes the existence of differential systems of knowledge that exist amongst various institutions and particularly amongst stakeholders (Armitage, 2008; Nadasdy, 2002). This consideration of political ecology is particularly

appropriate in the context of Inuit knowledge systems and western science based bureaucracy of the Canadian government.

Political ecology also offers a useful conceptualization of the nested hierarchies that shape governance systems and the linkages between each level and scale. This approach is particularly useful for this research because although adaptation initiatives will be taken up at the local level, the decisions pertaining to those adaptations will be developed through or influenced by unique phenomena and processes across multiple scales and institutions (Berkes *et al.*, 2003; Kasperson and Kasperson, 2001).

Through a political ecology approach this research will give particular attention to not only identifying the various institutions pertaining to the community identified sensitivities and the nature of their interactions and linkages, but will also draw upon the scope of political ecology to consider the role of knowledge systems and worldviews in decisions made about adapting to climate and related changes (White, 2006; Huntington, 2000). Similarly, the application of the vulnerability approach in this research provides a framework compatible with the scope of political ecology. In addition, the vulnerability framework provides a research approach which aims to understand the social, political and also the ecological aspects of a system, an area in which political ecology has been criticised (Walker, 2005). As discussed in the following section, the vulnerability framework also seeks to understand the community specific social, political and environmental characteristics as they influence how communities deal with changes and stresses such as climate change.

2.4.2 Vulnerability Approach

Used widely throughout much of the climate change impact assessment research, the community-based vulnerability approach is concerned with the existing socio-economic, political and environmental attributes of a community that shape their ability to deal with change or stresses (Ford & Smit, 2004; IPCC, 2007). The vulnerability approach provides this research with a suitable framework for identifying community specific opportunities to enhance local adaptive capacity. It is through a recently completed vulnerability assessment that the community specific exposures, risks and adaptive capacities were identified and the community of Hopedale was determined as an ideal study location for this research (DeSantis, 2008). This thesis also uses a vulnerability framework to identify and better understand the interrelated stresses related to climate change and to gain insight into options to reduce these stresses through adaptation interventions or plans.

This approach (Figure 2.1) illustrates the relationship between the context of a particular system, such as a community and the particular exposures and sensitivities that characterize that system. As it is suggested in the model, adaptation interventions or plans can influence the future adaptive capacity of a community or system. As there has been little research on the implementation of these strategies, or the processes through which they will be developed and undertaken in the context of the Arctic, this research places a particular focus on the governance mechanisms and processes that will serve to facilitate adaptation initiatives in the community of Hopedale, Nunatsiavut.

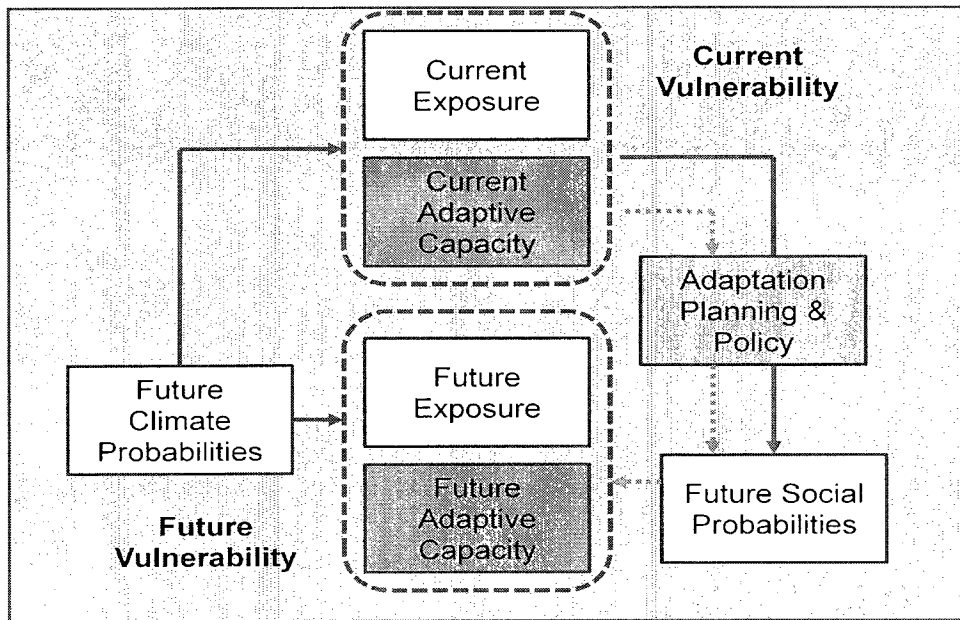


Figure 2.1 Conceptualization of vulnerability (Adapted from Ford & Smit, 2004).

The vulnerability approach considers the sensitivities and exposures of a system to stress such as climate and related change of both the biophysical environment as well as human beings when assessing community sensitivity (IPCC, 2007; Cannon *et al*, 2003; Smit and Pilifosova, 2003; Adger, 2006). This approach draws a great deal on the insights from the natural hazards literature which highlights the influence of socio-economic conditions that contribute to individual or community vulnerability to environmental stresses such as climate change (Wisner *et al.*, 2004; Huq *et al.*, 2003; Cannon *et al*, 2003; Yohe & Tol, 2002; Tol *et al*, 1998; Brooks 2003).

Vulnerability is expressed in the hazards literature as “...the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard..” (Wisner *et al.*, 2004). Similar to the vulnerability framework, the hazards approach considers the conditions of the underlying dynamics of socio-economic and political systems in terms of how those influence the ability of a household or

community to deal with a stress such as climate change. The hazards literature provides useful insight into underlying causes that contribute to vulnerability as illustrated through the pressure and release (PAR) model (Figure 2.2) (Wisner *et al*, 2004). Although designed primarily for application in spontaneous hazards and natural disasters scenarios, the PAR model is also relevant in terms of circumstances of the Inuit and climate change. The increasing socio-economic and cultural pressures in combination with the processes of climate change parallel the ‘progression of vulnerability’ depicted in the PAR model.

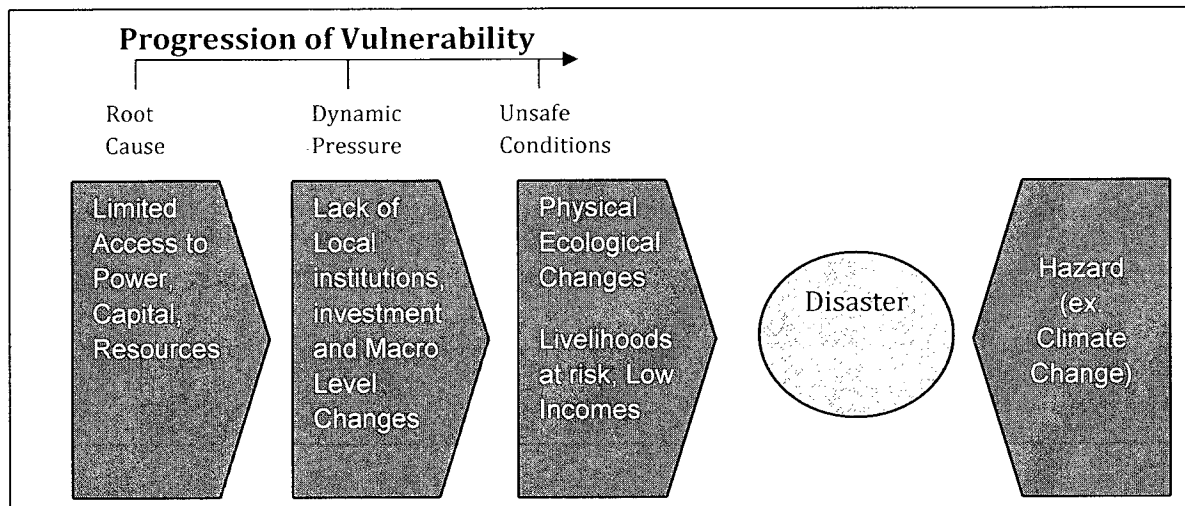


Figure 2.2 The Pressure and Release Model (Adapted from Wisner *et al.*, 2004).

Similarly, Smit and Pilifosova (2003) describe vulnerability as a function of key variables. Vulnerability is related to, among other factors, the adaptive capacity of a system. Adaptive capacity, discussed in the following section, can be understood as the various socio-economic, political and environmental factors that contribute to or reduce the progression of vulnerability illustrated in figure 2.1. This particular approach captures the influence of both environmental and human sources of stress which shape vulnerability and provides a useful lens

for understanding the potential options to increase adaptive capacity in response to increasing climate change.

2.4.3. Institutional Analysis of Social-ecological Systems

Following the theoretical frameworks of political ecology and the vulnerability approach, the Institutional Analysis and Development (IAD) framework also devotes a particular analytical focus to the human and ecological attributes of a system. The IAD framework however, provides a well developed framework which specifically assesses the institutional processes and interactions that pertain to a given system. This approach ultimately provides this research with an analytical tool to meet the second and third objectives of this research while also building on the underlying theoretical basis of political ecology and the vulnerability approach. The theoretical context for assessing social-ecological systems is further explained in the following section.

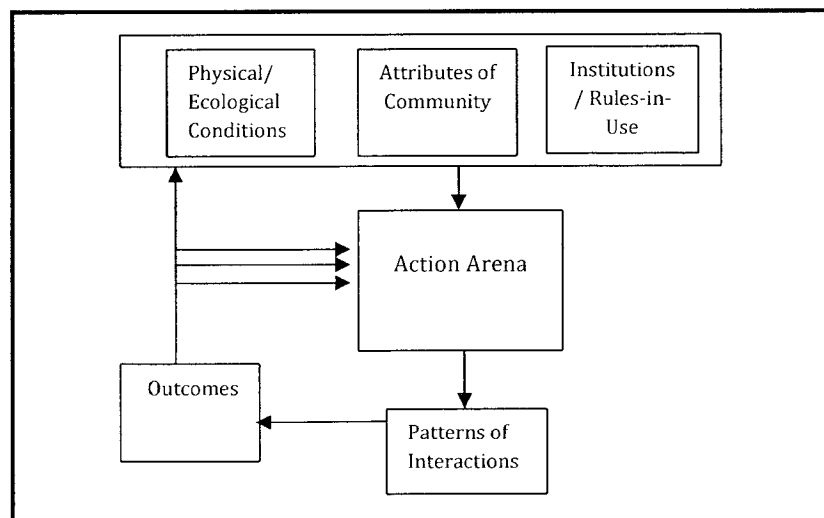


Figure 2.3 Institutional Analysis and Development Framework (Adapted from Ostrom, 2005).

To assess how capacity might be enhanced within a system, there is an inherent need to understand the formal and informal institutional dynamics of complex socio-ecological systems (Yohe & Tol, 2002; Folk *et al*, 2005). This framework is particularly useful in the context of understanding existing institutional and governance dynamics to begin to assess how these interactions might play a role in facilitating climate change adaptation, considering that such a framework is not extensively developed within the vulnerability or adaptation literature. The IAD framework approach is useful in this research context for its explicit scope of analysis that identifies the specific areas of interaction in a system that may contribute to enhancing or reducing adaptive capacity. This approach considers both formal and informal management institutions and rules in use, as well as the interactions between actors, stakeholders and that shape a particular resource issue (Rudd, 2004; Ostrom, 2007).

Similar to the vulnerability approach, the IAD framework guided the analysis of this research to assess the influence of the underlying attributes of the community of Hopedale, including the biophysical, socio-economic and governance and institutional structures. These institutions are each shaped by the knowledge systems that the institutions were developed within such as western-scientific and Inuit specific systems. Using this type of analysis framework draws attention to the inherent values and worldviews within these knowledge systems and how they may shape the interactions, actions or outcomes of the institutions and organizations identified throughout the research. The use of the IAD framework to explicitly examine the role of distinctive knowledge systems within a governance system is also not a new undertaking (see Pahl-Wostl *et al*, 2007; Akinola, 2007; LaFlamme, 2007). Pahl-Wostl and others' (2007) use of the IAD in water resource governance for example, allowed for an analysis of the institutions involved in water management. In particular, the IAD framework was used to

examine how water resource management participants with different interests interact within an ‘action arena’ and how these interactions influence the outcomes and decisions for participants or institutions. While the specific contexts of these examples pertain to other management issues such as water, land management and community development, the use of the IAD to the gain insights into institutional interactions with differences in knowledge systems and worldviews is consistent with this research.

2.5 Climate Change Adaptation & Adaptive Capacity

Humans and ecosystems have adapted to changes in environmental conditions in response to natural fluctuations, however, recent changes in environmental conditions are widely recognized as unprecedented (Nickels *et al*, 2006; Anisimov *et al*, 2007; Berkes *et al*, 2003). It is understood with the climate change adaptation literature that a range of adaptation strategies are employed. A typology suggested by Smit and Skinner (2002) identifies four main classifications of adaptations (2002). Table 2.1 includes the four categories and examples of the different types of adaptations, some of which are being undertaken in the community of Hopedale and will be discussed in chapter five. While primarily autonomous adaptations are occurring in response to climate change at the local scale, it is widely understood that adaptation initiatives or interventions are needed, particularly in sensitive regions such as the Arctic to ensure the capacity to cope with impacts from climate change (Burton *et al*, 2002; Anisimov, *et al*, 2007).

Classification of Adaptations	Type	Hopedale Examples
Intent & Purposefulness	Autonomous/Planned	Hunters waiting until solid sea ice before traveling or hunting
Timing & Duration	Responsive/Anticipatory	Harvesting extra food/wood in the fall in case the spring freeze up and access timing is later
Scale & Responsibility	Individual, Local, Regional, Governmental	Individual adjustments in hunting vs. regional planning
Form	Financial, Political, Institutional	Investing in jobs, Hunter Support Programs, Building Reinforcements

Table 2.1 Typology of Adaptations (Modified from Smit & Skinner, 2002).

Smit *et al.*, (2000) define adaptation as “adjustments in ecological-socio-economic systems in response to actual or expected climatic stimuli, their effects or impacts”. Adaptation is considered by many as a process of adjustments in a system to reduce vulnerability of that system (Huq *et al.*, 2003). Reilly and Schimmelpfennig (2000) suggest that the extent to which strategies for fostering adaptation are useful depends on the characteristics of the system that must adapt. It follows then that successful strategies to enhance adaptive capacity of a community need to be designed with the socio-economic, political as well as decision making structures and characteristics in mind. These governance systems and decision making institutions that will facilitate initiatives to enhance adaptive capacity therefore also need to be understood to allow for successful adaptation initiatives.

Related to the concept of adaptation is adaptive capacity. Burton *et al* (2002) define adaptive capacity as;

“...the ability of a system to adjust to climate change, including climate variability and extremes, to moderate potential damages, to take advantage of opportunities or to cope with the consequences”.

Smit & Wandel (2006) explain that the factors that influence adaptive capacity can range from a local to regional or global scales and can involve informal local networks and interactions as well as broad scale social and political arrangements. This understanding builds on similar

sentiments throughout climate change adaptation literature that emphasize the importance of enhancing the capacity of a system or community to cope with the unprecedented changes associated with climate change (Kelly & Adger, 2000; Yohe & Tol, 2002). Although not made explicit in the literature, the facilitation of these adaptations or interventions to enhance adaptive capacity involves a number of directly and indirectly related institutions and decision makers (Agrawal, 2008). Adaptation is therefore understood here to include improvements made to the underlying elements that comprise vulnerabilities in Hopedale. Strategic initiatives to enhance adaptive capacity that would be facilitated by the appropriate institutions are expressed throughout the literature as various forms of adaptation policy.

2.6 Adaptation Policy

Findings from vulnerability assessments in particular make it evident that adaptation interventions or policies will be necessary to cope with the current and emerging impacts of global environmental change (Smith, 1997; Ford *et al.*, 2005; Ford *et al.*, 2007). Budreau and McBean offer an explanation of adaptation policy as ‘...those measures taken by any level of government to facilitate changes in practices so as to lessen the overall vulnerability of the public’ (2007). Others include elements of socio-economic changes in their definitions. Burton *et al.*, for example, consider “...actions taken by governments including legislation, regulations and incentives to mandate or facilitate changes in socio-economic systems aimed at reducing vulnerability to climate change...” (2002). Despite the promotion for planned adaptation interventions, it is evident in adaptation and vulnerability literature that planned adaptation strategies have been limited in their application within the Arctic and elsewhere (Fankhauser *et al.*, 2006; Ford *et al.*, 2007; Kelly and Adger, 2000). Further research is required, focusing on the actual process of implementing or facilitating such adaptation policies. The few research efforts

in pursuit of a broader understanding of the process are largely being undertaken mainly outside of the Canadian Arctic region (Naess et al, 2005).

A great deal of the climate change literature is also directed towards the concerns of developing and less developed countries and their dealing with climate change (Huq et al, 2003; Adger, 2000). It is widely assumed that developed countries such as Canada, are better equipped to deal with climate change due to the resources and finances available (Thomas and Twyman, 2005). It is apparent in Arctic vulnerability literature and the Arctic Human Development Report however, that Canada is not immune to development challenges (ITK, 2007; AHDR, 2004). Significant disparities between key human development indicators such as life expectancy and income levels exist between Inuit and non-Inuit in Canada (ITK, 2007; AHDR, 2004). It has also been highlighted that adaptation policy is in many ways tied to sustainability (Lindseth, 2005). Burton *et al* effectively capture this by stating that

...climate change is not only a 'pollution problem' ...it is also a broad development issue - a problem in which the whole character and values of human society on a global level and its future sustainable development are at stake ...development has to be taken into account ... (2002, p. 8).

It is understood within adaptation literature that although autonomous adaptations will occur, the necessary incentives, resources, knowledge and skills required for successful adaptation may not be sufficient in every community (Frankhauser *et al*, 1999). As suggested above, there is also consensus that adaptation policies will need to be specific to local and regional contexts and will involve local governance systems (Naess, *et al.*, 2005; Smit & Pilifosova, 2003; Lindseth, 2005; Burton *et al.*, 2002). One approach to implementing adaptation initiatives which has received some attention in the literature is that of mainstreaming.

2.6.1 Mainstreaming

Within adaptation literature there is consensus that adaptation policies need to be mainstreamed into existing management and decision making processes and structures (Smit and Wandel, 2006; Huq *et al.*, 2003; Adger, 2001; Koch *et al.*, 2007; Budreau & McBean, 2007). Although a great deal of this discussion has focused on mainstreaming in the context of developing countries, the same idea applies in the context of other regions including the Arctic.

Mainstreaming is perceived in the context of adaptation planning as making the most of existing management plans and policies by integrating adjustments or enhancements to account for stresses associated with climate change (Huq *et al.*, 2003). In order for mainstreaming to take place, it follows that an understanding of both the underlying stresses of climate change as well as the institutions that are involved. The influence of institutions and systems of governance in decision making processes has been explored throughout much of the literature.

2.6.2 Governance & Institutions

Climate change literature is drawing increasing attention to the need to consider the role of local and regional institutions and governance systems central to the development of adaptation policy (Naess, *et al.*, 2005; Folke *et al.*, 2005; Ford and Wandel, 2006; Armitage, 2005). Discussions have focused on how and through which mechanisms adaptation will be facilitated (Naess, *et al.*, 2005; Berkes *et al.*, 2007; Keskitalo, 2004). White (2006) explains that

“Governance is...very much a function of the rules—formal and informal—and the organizational culture of the institutions of governance. In turn, rules, institutions, and cultures are deeply rooted in worldviews and values” (White, 2006).

Understanding the role that governance structures and their linkages and interactions across scales will play in developing climate change adaptation policy, however, has received limited attention (Burton *et al.*, 2002; Lemos and Agrawal, 2006; Keskitalo, 2004). With respect

to environmental governance, Lemos and Agrawal point to an important aspect in understanding governance systems (2006). They highlight that the influence of “political-economic relationships that institutions embody...” should be considered in terms of “how these relationships shape identities, actions and outcomes” (2006). Adger (2003) highlights some of the many challenges and complexities that emerge at any scale when decisions are undertaken. Adger points out how “...decisions privilege one set of interests over another and create winners and losers” (2003). Bulkeley (2005) also draws attention to the interrelatedness of environmental governance and environmental politics. The influence of these explicit as well as subtle political and power related dynamics in adaptation decision making processes, particularly in the context of the politically complex Canadian Arctic, requires consideration.

There has been an emerging understanding that the role of institutions in the process of adaptation to environmental change requires further attention (Tompkins and Adger, 2003; Smit and Wandel, 2006; Naess *et al*, 2006). Implicit in these discussions is that responses to environmental change will need to be adopted and facilitated by existing institutions and stakeholders. Local institutions have constantly been adapting, therefore, future adaptations should also be facilitated through local level institutions. In the context of climate change, Naess and others (2005) suggest that institutions affect the social distribution of vulnerability, as well as determine the management of climate-sensitive aspects of society and the capacity to adapt successfully. (Naess *et al*, 2005). Institutions also facilitate the horizontal and vertical linkages within and between scales of a community. This notion is well covered in the literature on stakeholders and governance (Berkes 2002; Keskitalo, 2004; Adger, 2003; Lemos and Agrawal, 2006). Bulkeley (2005) further emphasizes a need to understand such linkages and scales by suggesting that communities often function as more of a mosaic, rather than a hierarchical

structure. Identifying the organization and structure of these systems, including the key actors or stakeholders within is also central to understanding the related system of governance.

2.6.3. Stakeholders

Various stakeholders make up and shape the unique formal and informal institutions discussed above. Increasing recognition for the role of various stakeholders and their interests in the process of adaptation is evident (Naess et al., 2005; Berkes and Jolly, 2001; Adger, 2001; Keskitalo, 2004). Beyond the definition presented in chapter one of this thesis, the notion of stakeholders is broadly defined in the context of environmental change as;

“...a range of actors spanning major decision makers, sector and actors on different levels, and citizens who will encounter general effects ...in the form of changes in the environment or social dynamics...” (Keskitalo, 2004).

Armitage *et al* (2007) similarly define stakeholders as “individuals or groups (including governmental and non-governmental institutions, communities, research institutions, development agencies) with an interest or claim”.

In related literature on participation (Chambers, 1996), social capital (Adger, 2003; Pretty and Ward, 2001), collective action (Tompkins and Adger, 2003) and entitlements (Adger, 2003; Keskitalo, 2004; Sen, 1981), it is understood that institutions, stakeholders and governance systems play a significant role in determining the outcome of resource access, management and use. Without an understanding of the unique nature and influence of these actors and agents in the management of resources, adaptation plans or strategies could render themselves inadequate.

Within environmental change adaptation literature, questions surrounding who is and who is not involved in the decision making processes and what interests are being met have emerged (Smit *et al.*, 1999; Adger, 2001; Cannon, 2003). Keskitalo (2004) draws attention to the

socially constructed nature of ‘stakeholders’. It is suggested that assumptions made about various interest groups may exist between actors, institutions and communities (2004). The notion of perceived interests or perspectives is particularly relevant in the case of the Inuit across the Arctic. While many similarities exist among Inuit communities across the north in Canada, there are also distinctions between each region and community (Collingnon, 2006). Recognizing these differences also suggests that decisions regarding adaptation will perhaps follow different paths or be facilitated differently depending upon the structure and nature of the systems of governance. This suggests that identifying not only the numerous stakeholders and agents affected by climate change, but also deciphering the inherent differences amongst perspectives not only at the local scale, but across multiple scales, will be necessary in the process of developing adaptation policies to ensure that they are compatible with local interests and systems and thus sustainable.

2.6.4 Multi-Level Policy Development

“Adaptation is made up of actions throughout society, by individuals, groups and governments”

-Adger et al, 2005

The case for multi-scale adaptation policy development to deal with the implications of climate change is well supported in the literature (Kasperson *et al*, 2005; Naess *et al.*, 2007; Adger, 2001; Keskitalo, 2004; Berkes *et al*, 2007). Adger emphasizes “...individual adaptation actions are not autonomous: they are constrained by institutional processes such as regulatory structures, property rights and social norms associated with rules in use... (2005). Due to the myriad mosaic of institutions, stakeholders and governance systems, it is evident that adaptation initiatives will occur across and within multi-level processes. In reference to a multi-scale

approach, Clark and others suggest that “... the location-specific characteristics of both environmental impacts and management mean that effective responses require integration across global, regional and local levels of governance...” (2002). Further to the notion of mainstreaming, a multi-scale approach reiterates the necessity for policies to be implemented or integrated across the appropriate levels of governance structures.

Scholars suggest that adaptation developments are needed in the form of integrated policy measures across regions and scales in order to reduce the impacts of climate change (Fankhauser *et al* 1999; Anisimov *et al*, 2007; Tol *et al*, 1998). It is also discussed in the literature that effective responses to climate change are likely to require a diversity of actors and organizations across the state-society divide (Naess *et al*, 2005). Koch *et al* (2007) suggest a conceptual framework of institutional dynamics and climate change adaptation to better understand the relationships between institutions and to better inform policy making decisions processes. Regardless of the approaches taken to perform this type of analysis, it is evident throughout the climate change adaptation literature that there is an important place for governance and institutional analysis in the realm of adaptation.

2.7 Knowledge Systems & Adaptation

Within discussions of power, politics and governance processes is the interrelated issue of knowledge systems. Knowledge systems can be understood as a representation of specific worldviews and reflection of power relations (Berkes, 1999; Escobar, 2006). As indicated in an earlier section, Inuit people of Canada express a unique worldview which has evolved over millennia to comprise a system of knowledge which is unique to Inuit and distinct in certain ways from the predominant ‘western-scientific’ knowledge system (White 2006; Berkes 1993). An Inuit knowledge system is unique from western-scientific knowledge by way of the values,

experiences, principles and worldviews that are specific to the history and culture that are held by Inuit people. Indigenous knowledge systems, including an Inuit knowledge system is distinguished by its pragmatic, sensory and memory based and holistic attributes (Berkes *et al*, 2005; Snively & Corsiglia, 2001). Western-scientific knowledge on the other hand, is characterized by its positivist, cause-and-effect based, isolation from nature attributes (Berkes *et al*, 2005; Snively & Corsiglia, 2001). As the governance structures and processes of the federal and provincial governments in Canada are based in a western-based knowledge system, it is suggested that the knowledge systems unique to Inuit people are politically unequal and disadvantaged (Berkes 1993; Stevenson, 1996). In Canada, through the process of reclaiming political power and determination through land claim agreements, Inuit people have reaffirmed their knowledge systems and interests as distinct from the predominant federal system. It is possible that the achievement of land claims agreements by Inuit of Canada will serve to ensure the integration of Inuit knowledge systems in subsequent negotiations or decision making processes that span multiple scales and systems of governance. However, uncritical adoption of these processes within climate change adaptation policy developments, particularly in an environment dominated by western-scientific knowledge, could contribute to a shift towards privileging western-science knowledge and processes and compromised Inuit influences in these processes in Canada.

Despite the diversity of Inuit communities across the Arctic, a common thread of the pursuit of self determination, specific to the interests and perspectives of Inuit characterises communities of the Arctic. These common Inuit specific interests have largely formed the basis of the four Inuit land claims agreements that have occurred in Canada in recent years. It follows then, that decision making processes that take place in the Arctic will involve, to some extent, a

knowledge system that is unique to Inuit people in the Arctic. Actual integration of these two knowledge types particularly within the Arctic has been subject to much debate (Berkes 1993; Stevenson 1996; Huntington 2000). In the context of adaptation to climate change specifically, critical assessment of the process of integrating or overcoming these distinct knowledge systems remains largely unexplored in the Arctic.

Given the multi-scaled, multi-institutional breadth of adaptation policy to deal with climate change, it is evident that the topic of knowledge systems, particularly in the context of the Canadian Arctic, plays an important equally relevant role in this discussion of governance and institutions as well. In fact, the undertaking of a governance and institutional analysis provides an ideal opportunity to explicitly and critically assess where and how these knowledge systems will be integrated in climate change adaptation decision making. Furthermore, consideration for these interrelated issues creates a unique analysis of the political dynamics of climate change adaptation also identified through the vulnerability approach, political ecology and the Institutional Analysis and Development Framework of social-ecological systems. Drawing on the multiple yet interrelated bodies of literature and research approaches provides this research with the necessary theoretical and practical tools to undertake a unique assessment of the governance, institutions and knowledge systems involved in adaptation to climate change in the Arctic. Such an analysis is particularly significant as it is a novel endeavour for the relatively new Inuit region of Nunatsiavut, described in the following chapter three on the research study area.

CHAPTER THREE

STUDY AREA

3.1 Rationale for Study Area

Hopedale was selected as an appropriate location for this research for several reasons. Firstly, the recent completion of a community vulnerability assessment to environmental change in Hopedale by a colleague provided the researcher with a preliminary understanding of the concerns pertaining to climate and other changes in the community (DeSantis, 2008). Given that the aim of this research was to understand how adaptation to climate change might be managed in light of the community specific vulnerabilities, the completed vulnerability assessment as well as the relationship already established with the community by the previous research project presented an opportunity to follow up with the community on their concerns regarding climate change and adaptation.

The rapport garnered by the previous researcher with the community as well as the introduction to climate change adaptation research meant that familiarity with the research in the community and within the Nunatsiavut Government had been established and was helpful in securing support and legitimacy of the research as well as constructive feedback regarding the aim and research approach prior to the beginning of the field season. By also building on pre-existing contacts between the local and regional governments and the University of Guelph's Global Environmental Change Group, it eased the interaction and communications and contributed to a positive working relationship. The timely nature of this research during the transition phase of the Nunatsiavut Government and the Nunatsiavut Interim Research Committee resulted in a mutually beneficial initiative as this research sought to follow up on previous findings identified by the community while the Research Committee was formalizing

their standards for research proposals to be based on community interests and needs. The pre-emptive community-based focus of this research was viewed favourably by the Interim Research Committee and contributed to the support and approval of the research in Hopedale, Nunatsiavut.

As a newly founded settlement region of Inuit self-government in 2005, Nunatsiavut was also a desirable site for this research as it provided a situation whereby the current transitional status of government and governance structures presented potential opportunities to identify strategies that deal with climate and related changes that could be integrated into ongoing management organization and decision making processes. The transitional period presents opportunities to mainstream adaptation initiatives or strategies within newly formed institutions and transitional systems of governance. The windows of opportunities identified within the governance structures through this research provided an opportunity for local and regional government to integrate capacity enhancing initiatives within new departments or programming. This would provide the government and non-government institutions with information to improve current capacity to deal with the related impacts of climate change and reduce future vulnerability of Hopedale and other communities along the coast in Nunatsiavut.

3.2 Study Site Context

Hopedale is located at approximately latitude 55° 45' degrees north and longitude 60°13' degrees west (Figure 3.1). Though not situated within the Arctic Circle, Hopedale and other communities within Coastal Northern Labrador highly resemble the climatic and livelihood characteristics found in Arctic Canada. The harvesting and consumption of *country foods*¹, the

¹ Country foods or wild foods are locally available animals, fish and plants harvested by Inuit for consumption including, for example, fish, seal, caribou, berries, birds and bird eggs (ITK, 2008).

dependence on ice for travel and hunting, the existence of traditional knowledge of the sea and land passed on between generations, are but a few examples of these similarities. In addition, the Northern tip of Labrador extends into the 60° line of latitude and is a region in which many hunters and fishers from Hopedale identify with as part of their history and identity as it is a territory that has been used traditionally for seasonal hunting, trapping, fishing and gathering. Travel throughout the coast of Labrador has been common for the past 250 years or more making it part of the community's collective and on-going history (Brice-Bennett, 1977; Borlase, 1994).

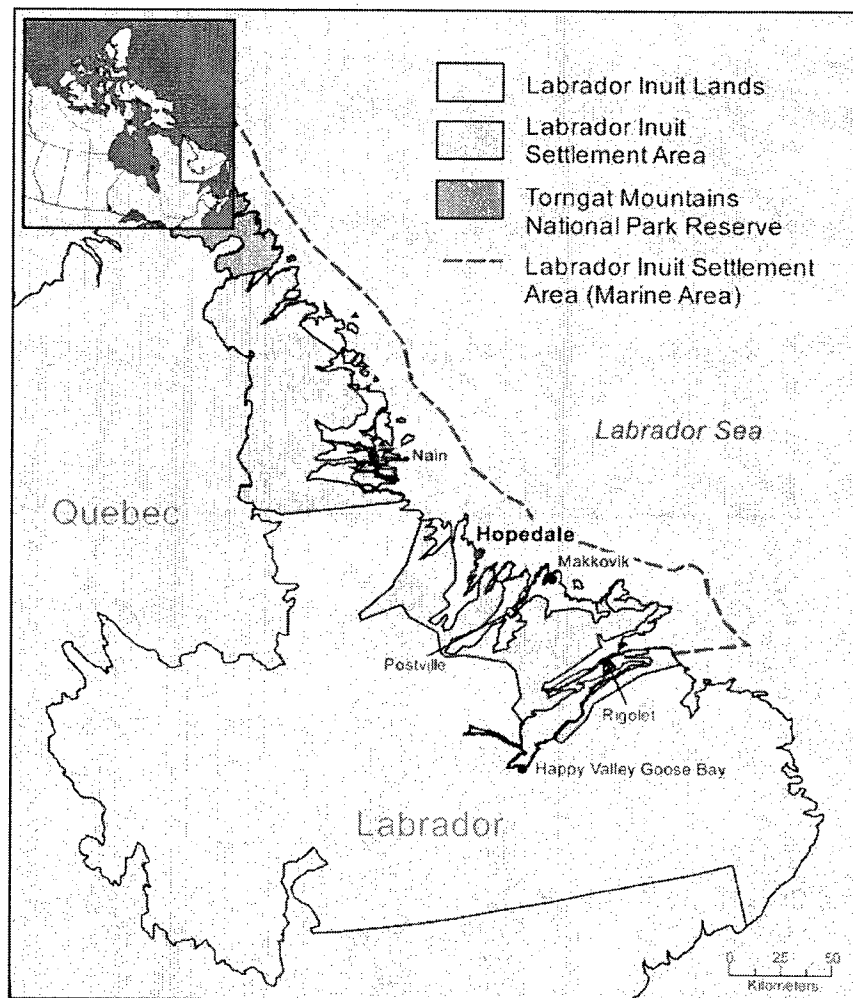


Figure 3.1 Hopedale & the Nunatsiavut Land Claims Area, Labrador.

Hopedale is a predominantly Inuit community with a population of approximately 550 situated on the coast of Northern Labrador (Statistics Canada, 2006). It is the third most northerly and second largest community after Nain and before the Innu community of Natuashish, on the Northern Labrador coast. The community is comprised of 97% Inuit who are beneficiaries of the recent Labrador Inuit Land Claim Agreement. Labrador is a geographical region that is referred to as Arctic or Sub-Arctic due to its proximity to the Arctic Circle and exposure to both Arctic and Sub-Arctic climates. Similar to other Inuit communities in this geographical region, the residents of Hopedale are closely connected to and reliant on the land and sea for its natural resources for both employment and consumption purposes. Although it falls just below the 60th line of latitude, it is a region that is characterized by Arctic climates and communities that are significantly reliant in the quantity and duration of snow cover, sea and fresh water ice and freezing temperatures for efficient winter and spring travel over the land and sea. It is due to these attributes of Arctic communities that make it a region highly susceptible to environmental changes due to global climate change (Fitzhugh, 1999; ACIA, 2004).

3.2.1 Biophysical Attributes of Hopedale, Nunatsiavut

Hopedale and the surrounding region is characterized by a rugged tundra and barren landscape subject to harsh extreme cold arctic winds pushed southward via the cold Labrador Current in conjunction with the North Atlantic Oscillation (NAO) (Hurrell, 2003). Due to the pathways of ice age glaciers, extreme, mountainous cavities and fjords jut out at the most northerly peninsula of Labrador and gradually decrease in height and frequency southward along the coast (Borlase, 1993). The inlets and bays along the coast that meet freshwater ponds and rivers have been home to abundant fish and other marine wildlife spawning grounds for millennia and is where Inuit have seasonally migrated to for abundant sources of food (Brice-

Bennett, 1977). The seasonal warming and cooling, and subsequent freezing and thawing of the Labrador Sea facilitates the northward and southward migration of numerous marine and terrestrial wildlife including bowhead (*right*) whales, white whales (*beluga*), minkie whales, polar bears, seals (*bearded, spotted, jar, square*), capelin, caribou, foxes, arctic hare, wolves and others (Fitzhugh, 1999; Brice-Bennett, 1977). The climate of the coastal region in particular is characterized by extreme winds, heavy snowfall and blizzard-like conditions in winter with often foggy and rainy conditions throughout the spring and summer months (Environment Canada, 2004).

A diverse range of vegetation is found from the northern limits southward and across the interior to the coastline due to the differences in climate, mountain ranges, and precipitation (Environment Canada, 2004). Sparse forest cover consisting of short spruce and pine trees and low lying shrubs are found across the southern interior and becomes gradually sparser northward where stunted lichen and moss is found between exposed ranges of granites (Brice-Bennett, 1977). The landscape of Labrador has long shaped the lifestyle and traditions of the Inuit who inhabited the region centuries ago.

3.2.2 Historic Labrador

An understanding the present day community of Hopedale can be developed through an overview of the history of Labrador. Two of the most notable events derive from the influences of the Moravian mission established in early 1750's and the later arrival of European Settlers in the 1800's. The Moravian missionaries were European Christian missionaries of the Moravian Church who traveled to North America to spread Christianity along the Coast and to convert Inuit of the region (Brice-Bennett, 2003). Their success in converting Inuit to Christianity is

evident by the historic Moravian mission buildings and churches erect and well attended for weekly masses in Hopedale and other communities along the Labrador coast today. Most European settlers came to the coast to either follow the mission or to seek out economic opportunities in the fishery industry. The centuries of co-existence between Europeans and Inuit led to a ‘mixed’ Inuit-European population, discussed later, which also influenced the social and economic dynamics of Labrador. These events have contributed to the dynamics of communities along the coast today, and provide insight into the opportunities and challenges of adaptation to a changing biophysical environment.

Inuit of the region were semi-nomadic and set up camps in tune with the seasonal ebbs and flows of the abundant land and marine species along the coast. These resources such as fish, seal, whales, birds and caribou were harvested to meet subsistence needs in the form of food and materials for housing and clothing as well as sources of income through trade (Brice-Bennett, 1977). The Inuit who lived in this region travelled throughout coastal Labrador mainly into the bays and inlets during summer and fall while spending spring stationed in one of the bays in sod houses. The way of life at this time was based on intimate understanding of and survival from the land and sea which had been cultivated through generations of experience and knowledge of the region. Despite the changes that eventually came with settlement along the coast, it is this close connection to the natural ecosystem and wildlife patterns that continued to shape the activities of Labrador Inuit until the present day.

3.2.3 Settlement

Hopedale became a settled community shortly after the Moravian mission, established in 1771. The arrival of Moravian missionary Jens Haven from Denmark, who was fluent in the

local Inuit language through his earlier experiences with Inuit people and culture in Greenland, facilitated a trustworthy relationship with many local Inuit. The Moravian mission contributed to a dramatic change in the social, political, spiritual and economic structure and dynamic that is still evident in Hopedale today (Borlase, 1993). Moravians were the first to introduce English letters used in written translations of Inuktitut supplementing the previous system of Inuktitut oral communications. The mission set up opportunities for economic exchange, created a schooling system and established a system of Inuit Elders who facilitated rule making and order in the community. The mission, though unsuccessful at first, eventually led to the conversion of Labrador Inuit to Christianity. Labrador Inuit are amongst the earliest Inuit in Canada to be converted to Christianity. Despite this adoption of Christian concepts and beliefs, Inuit maintained much of their traditional spiritual beliefs and ideologies. Though not fully understood throughout the literature, it is suggested that since many attributes of Inuit spirituality deal with hunting, fishing and their interaction with the environment, and these were elements of Inuit culture that were not replaced with Christian concepts, this enabled the upholding of Inuit spiritual beliefs despite Inuit conversion to Christianity (Brice-Bennett, 1977; Fitzhugh, 1999). It has been suggested that a form of dualistic spiritual doctrine developed amongst Labrador Inuit, one which continues to evade in depth analysis and understanding in the Labrador coast.

The European Settlers who arrived in the region through the establishment of the Moravian mission changed the region as well. As settlers arrived from Scotland, England, Ireland and Newfoundland they set up semi-permanent housing in the protected and abundant bays south of the Hopedale Mission. These initial settlers were referred to as 'baymen', as they depended largely on the species found and harvested within their respective bays. These bays would later become named after the families who were settled there. The organization of

settlement patterns that took place during the 17th & 18th Century played a significant role in the organization of hunting and fishing rules and norms of Inuit as they became more sedentary. With the creation of the Inuit Elders' council, principles of sustainability and protection of the land were established to avoid overexploitation of species within a certain region. If a particular family or hunter had laid claim to a particular bay, elders encouraged hunters to seek out new locations for hunting and fishing that did not interfere with another hunters' zone. Inuit were accustomed to travelling to traditional hunting and fishing areas up and down the coast, therefore when they became more sedentary they found that the best locations for fishing and hunting nearby were already occupied by the settler families in the bays south of the community (Brice-Bennett, 1977; 2003; Borlase, 1994).

The mission's connection to Europe created a market for the abundant harvests of fish, mainly cod and salmon, and fur pelts from trapped seal, marten, foxes and birds. Hopedale's social organization became centered on the cod harvests which involved cleaning, salting and packing large barrels full of cod to be shipped. It has been noted that Inuit had a difficult time obtaining the necessary cod jigs and trapping lines held by settlers and instead served largely as workers in the processing of cod fish. The establishing of the Mission provisions store in 1817 also served to enable Inuit and Settlers to purchase goods such as flour, sugar and building materials through a credit system (Newfoundland Historic Trust, 2003; Borlase, 2003). This system would later present challenges when the cod harvest began to dwindle and the price of goods continued to increase. The presence of the provisions store marked the beginning of Inuit and Settler dependence on store bought foods as well as the beginning of a movement away from an absolute reliance on the land and sea for sources of food (Brice-Bennett 1977; Borlase, 1994).

Through the long term presence of the Mission, Hopedale's demographics changed. As European settlers moved into Hopedale, marriages between settlers and Inuit took place. The population sometimes referred to as *Kablunângajuk*, which, when translated means 'almost white men', are described as the decedents of European and Inuit parents, most often a European father who took an Inuit wife (Borlase, 1994; Hanrahan, 2003). This population has been interpreted and represented differently throughout much of the historical writing on Labrador Inuit. For example, this population has been considered 'Inuit', 'half' Inuit or 'half' Eskimo, while others perceived them as descendants of Europeans who were considered fully European and non-Inuit (Hanrahan, 2003: Borlase 1994). This ambiguous distinction came into discussions during the negotiation of the Labrador Inuit Land Claims, discussed below.

The closure of the missions in OKak and Hebron, north of Hopedale, due to the devastation from the spread of the Spanish flu, led to the resettlement of the surviving Inuit families in the mid 1950's to Hopedale and other communities along the coast. The move has been considered unsuccessful according to the resettled Inuit families, as there was insufficient housing, hunting areas or assistance given to the relocated families upon their arrival to Hopedale (Brice-Bennett, 2003). This significant event, still a painful memory for the surviving residents who were relocated, further contributed to the social-economic complexity in Hopedale. New residents dealt with poor housing conditions, overcrowding and had to seek out new harvesting areas as many of the preferred locations for harvesting were already occupied by local families. Although the harvesting areas would later become more equally accessible, the living conditions of many relocated Inuit families, now mainly elders, continue to be of poor quality even today.

The settling of the Labrador Inuit Land Claims Agreement in 2005, however, has contributed to significant change in Hopedale and Nunatsiavut. The impacts of this change continue to unfold at the time of this research.

3.2.4 The Nunatsiavut Land Claims Agreement

The Labrador Inuit Land Claim Agreement of 2005 officially transferred the governance of the land and resources as well as a number of other items, in the area outlined in figure 3.2, to the Nunatsiavut Government. This land claim process began back in 1977 with the filing of the land claim by the Labrador Inuit Association (LIA) (Nunatsiavut, 2007). The LIA was the original governing body that officially represented Labrador Inuit interests and engaged with the province of Newfoundland and Labrador. When finally settled in 2005, the agreement laid out the negotiated details of land ownership, resource access and management, membership and self-government. The 343 page document provides insight into the details of the institutional and governing structures and processes of the Nunatsiavut Government. Since 2005, the Nunatsiavut Government has been undergoing a process of transitional government as they systematically sort out the governmental structure, departments and organization for the first time.

One of the features of the Land Claim Agreement that raised some concern amongst residents of Northern Labrador was the eligibility and enrolment section in chapter three which defines beneficiary eligibility. This particular section of the agreement has been considered contentious amongst some Inuit within and outside of Nunatsiavut due to the qualification of Inuk status. An Inuk refers to the singular form of Inuit. This debate regarding who qualified as an Inuk dates back to the initial Labrador Inuit Association membership in the 1970s. At that time, the population of Labrador referred to as *Kablunângajuk* were included in the LIA

membership definition. This decision to include the *Kablunângajuk* however, continued be questioned amongst some Labrador Inuit until it resurfaced during the Labrador Inuit Land Claims negotiations in 2004. When determining who was included as beneficiaries to the Land Claims Agreement, the LIA in conjunction with the Nunatsiavut Government interim committee agreed to include *Kablunângajuk* in the definition of an Inuk. In particular, an individual who met the following requirements was given Inuk designation according to Inuit Customs and Traditions:

- a) Inuit ancestry;
- (b) No Inuit ancestry but who settled permanently in the Labrador Inuit Land Claims Area before 1940; or
- (c) No Inuit ancestry, but:
 - (i) Is a lineal descendant of an individual referred to in clause (b); and
 - (ii) Was born on or before November 30th, 1990;

Box 3.3 Determinants of Inuk status in the Labrador Inuit Land Claims Agreement (2005).

The intent was to ensure fair access and rights to the land, its resources and the privileges as beneficiaries of the agreement. Although the agreement officially deemed most residents as Inuit, there is a continued and controversial distinction between Inuit and *Kablunângajuk* amongst some Nunatsiavut residents. This is generally not discussed openly amongst community members.

Some of the tension that underlies this debate originates back to the initial settlement of Inuit from Hebron and OKak to the southern communities of Labrador. Amongst some residents of Hopedale, a social stigma appears to be associated with those considered to be Inuit, particularly those who have relocated from the northern regions to Hopedale and other settlement communities along the coast. Part of the friction between these groups in Hopedale in particular stems from the division of resource access at the time of relocation. The resource abundant bays

in which Hopedale families hunted and fished for generations were mostly occupied when the resettled Inuit families moved from OKak and Hebron. The newcomers to the community were left to find new bays and inlets to hunt since they were quite far from the bays and inlets they frequented further north, although some hunters continued to travel north to Hebron to hunt and fish in their traditional harvesting areas (Brice-Bennett, 2003; DeSantis, 2008). The land claim agreement made it clear that all residents would have equal access to hunt and fish for subsistence and ceremonial needs within the boundaries of the Labrador Inuit Lands. These historic claims over certain bays remain an underlying concern amongst some community members in Hopedale who historically did not have a claim such as a cabin in certain preferable bays and have not been able to secure one since. The sensitive and contentious nature of this historic issue, however, limits the extent to which it is openly discussed in the community. This dynamic does, however, shed light on the current social-economic context of Hopedale and Nunatsiavut.

The Land Claims Agreement of 2005 outlined the governance of the Labrador Inuit Settlement Area (LISA), with the management of certain resources transferred from provincial jurisdiction to the Nunatsiavut Government. To date, the Nunatsiavut Government has established a number of self-governing departments such as the Department of Lands and Natural Resources and the Department of Health, Education, Social and Economic Development. Some institutions including health continue to be run by the Newfoundland provincial government in the interim. The timeline for the fully transitioned structure of the Nunatsiavut government is unknown. However, through this analysis of existing capacities and constraints of existing governance arrangements, potential avenues for capacity development or enhancement may be identified and provide useful for future Nunatsiavut governance.

3.3.5 Social-Economic Attributes

Hopedale continues to be a community based on subsistence fishing, hunting and gathering but has moved away from an entirely resource based economy in recent decades. The loss of the fishing industry in Hopedale has not been replaced with alternative resource based industries, despite the abundance of nearby resources. The lack of development, in addition to the limited infrastructure in Hopedale, has contributed to a scarcity of employment opportunities. Hopedale residents have to also compete with individuals from outside Hopedale from St. John's and elsewhere in Newfoundland for jobs within government, services, health and education. In a study conducted by Statistics Canada, it was found that 'better job prospects' was identified the by 70% of Inuit adults in Labrador as their top concern to improve lives in their community (Statistics Canada, 2001). Unemployment in Hopedale in 2001 was 35.7% (Statistics Canada, 2001). In addition, future growth of the community is expected to only exacerbate the issue of scarce employment opportunities. As of 2006, the mean age in Hopedale was 25.5 and over 40 percent of the population was under the age of 20 (Statistics Canada, 2006). Competition for employment is expected to only become more challenging if new opportunities are not created.

Nearby developments in nickel mining in Voisey's Bay by Vale Inco, forestry products in Postville and fisheries in Nain present some opportunities for Hopedale residents who are able to secure employment, often temporary or seasonal positions, in these industries. Local developments have been limited, however, with the exception of some of the spin off opportunities due to Hopedale's position as the Nunatsiavut capital. The construction of the new igloo designed Nunatsiavut Government headquarters in Hopedale, as well as the periodic influx of government representatives to the community for monthly meetings, for example, are contributing to temporary economic benefits for some Hopedale residents. Other economic

ventures on the horizon include the possible installation of wind turbines just outside the community (Personal communication, Hopedale Inuit Community Government, June 2008). This \$3 million venture, led by Wind Prospect, a firm based out of the UK, would generate local employment during the construction phase and would also involve at least one permanent position for operation and maintenance of the turbine (CBC, 2008). The status of this development is unknown at the time this thesis, however, the presence and financial support from the wind power company in local events such a recent guest performance in Hopedale suggests there is a long term interest on the part of Wind Prospect in Hopedale as a potential site for wind energy developments. The spin off effect of this type of development would also likely result in reduced energy costs and reduced dependence on diesel energy in the community.

In addition to limited employment opportunities, Hopedale residents experience high costs of living. The cost of store foods alone contributes to a higher cost of living. In a comparison of food prices across the Arctic with southern Canadian cities it was found that the same basket of staple foods such as milk, bread and meat costs 36 percent higher in Labrador than in St. John's, Newfoundland (Statistics Canada, 2001). It was also found that Labrador Inuit are the least satisfied with the quality and freshness of foods available in the community stores, in comparison with all other Inuit regions across Canada (*ibid*).

Housing conditions and availability in Hopedale are problematic. Overcrowding, a common issue amongst Inuit across the Arctic, is evident in Hopedale as well. In a community of approximately 600 people, there are less than 200 registered mailboxes at the local post office. This includes mailboxes for a number of households currently not occupied due to a range of factors including contamination from the former dump on which a housing subdivision was built as well as fire and water damage, not an uncommon occurrence in the community. Fires are so

common in the community that over the period of one year, at least four homes and a community hall were damaged to some extent by fires (Personal communication, Hopedale residents, May 2009). The loss of homes due to fires further contributes to overcrowding and lack of adequate housing in the community.

Housing quality is of concern as well. According to Statistics Canada, in 2006, 36.7 percent of homes in Hopedale were in need of major repair (2006). The process for constructing or requesting a new home in Hopedale adds to the frustration of poor housing conditions in the community. Residents in need of improvements to their home or in need of a new home are placed on a list and are attended to in order of the list. Concerns from the community, however, suggest that certain individuals either on the list or not, who have relatives or friends in local government are prioritized above others on the list and their homes are fixed first. This situation further complicates the issue of poor housing in the community and the relationship between the community and the local government.

Living conditions in conjunction with limited employment opportunities are just some of the social-economic challenges experienced by some residents of Hopedale. These challenges have become such a concern for the community recently that a petition has circulated within the community petitioning the government to relocate the community (Personal Communication, May 2009). The interest in relocation is not new to Hopedale. In the early 1980s, a similar petition was signed and supported by approximately 80 percent of the community to only be overturned by the local government at the time. It has been suggested by a number of residents of Nunatsiavut that due to the Mayor's business interests and investments in the community, the lack of financial support for businesses during the relocation was a major factor in the overturning of the relocation petition. The motivation behind the community's wish to relocate

now is similar to the concerns almost thirty years ago. Lack of suitable land for housing development, contamination from the dismantled American military base and waste disposal as well as the scarcity of resources such as forests are some of the reasons supporting the recent relocation petition in Hopedale. Prior to considering relocation, the Nunatsiavut Government is working with the Northern Contaminants Program to assess the extent of the contamination in Hopedale to determine the feasibility and costs of clean up.

The historical and cultural transformations that have taken place across Labrador are complex and continue to influence the nature of interactions within the coastal communities to this day. This overview of the historical and present context of the community of Hopedale sets the backdrop important for the findings discussed in chapters five and six. In the following chapter, the methods and research approaches taken to conduct and analyse this research are introduced and explained.

CHAPTER FOUR

RESEARCH METHODS

4.1 Research Approach

A range of research methods and approaches were utilized to achieve the aims and objectives of this research. The four main objectives include:

1. Summarize current and future social, political, economic and environmental vulnerabilities in Hopedale;
2. Document existing governance structures and systems pertaining to identified vulnerabilities;
3. Describe and explain the role of Labrador Inuit Knowledge within these governance systems;
4. Identify opportunities to enhance adaptive capacity to deal with climate change based on existing systems of governance.

The following chapter provides an overview of the approaches adopted for this research the rationale for selecting these methods and, finally, the implications of these methods for the outcomes of the research. This section also outlines details of the data gathering and analysis methods employed throughout this research process. The rationale and description of each method used is included within each sub-section.

4.2 Community-Based Approach

This research was guided by a community-based approach that aimed to capture community interests as best as possible. Where the opportunities existed, community members were active agents in the design and approach to the research. As demonstrated by ITK, research that is developed in partnership with the community members increases the value of the research for the community members themselves (ITK and NRI, 2007). This can occur through a range of

community engagement levels ranging from minimal involvement to maximal involvement through the three phases of research design, field work or data gathering and lastly in the data analysis and interpretation (*ibid*). This research sought to ensure local involvement wherever possible while also ensuring that the aims of the research are met. It should be understood that this involved a process of negotiation between the researcher and the community, or more specifically, the research advisory committee for the Nunatsiavut region. While the community interests and priorities were a large component of the scope of the research, the motivation of the researcher to pursue climate change related topics was also a factor in the shaping of this research project. By incorporating the interests of the Nunatsiavut Government as communicated by the Nunatsiavut Research Committee into the research scope as best as possible while also capturing the aims pertaining to climate change adaptation, both parties' interests were able to be met.

The process of community engagement was originally initiated through communications and contacts made by a previous student and colleague whose thesis research took place in Hopedale. Through her continued communications with key community leaders and Nunatsiavut Government representatives after the field research season, there was a window to discuss the possibility of further research following up on similar research themes. Through these email communications and submission of a pre-visit research licence, it was determined that a visit to the community would be appropriate and a chance to discuss the prospects for this research project.

The researcher joined the previous student during her dissemination visit to the community for a preliminary visit to Hopedale in February 2008. Through this initial visit, the research project was presented to the community and the Nunatsiavut Government and discussed

with individuals interested in the research. These individuals included Hopedale's AngajukKâk (mayor), a member of the Nunatsiavut Tourism Board and the curator of the Hopedale Mission House, and two other residents of Hopedale. A research license outlining the aims and approach for the research was submitted to the Nunatsiavut Government Inuit Research Advisor who reviewed the application to ensure that the proposed research was locally relevant and involved the community. During this visit the researcher also met with members of the Nunatsiavut Research Committee, a member of the Nunatsiavut Government Department of Lands and Resources and also the director of the Torngâsok Cultural Centre of Nunatsiavut. Based on the feedback provided during this meeting as well as from the Hopedale residents mentioned above, appropriate changes were made to the research design and proposal.

During the pre-visit, two local research assistants as well as a potential translator with interest in the project were identified to follow up with to be involved in the research process in Hopedale. The intention behind hiring a translator and interpreter was to ensure that all community members can potentially be involved in the research including residents whose first and only language is Inuktitut. The pre-visit also allowed the researcher to become more familiar with the community, arrange temporary living accommodations and determine a suitable time frame to initiate the field season. This was done by inquiring with the main contacts in Hopedale based on the time frame allotted to the researcher to conduct the field work, between the months of May and August of that summer. A follow up visit was also budgeted and communicated to the community through the research licence application to be completed upon the finalization of the thesis results in the following year.

The follow up visit was designed to ensure feedback and verification of the research results by community members and relevant government representatives. The approach used for

the follow up visit closely followed the guidelines and principles recommended by the national Inuit organization, ITK's *Guide to Negotiating Research Relationships with Inuit Communities* which advises researchers on proper data transmission and communication with northern communities (ITK and NRI, 2007). These guidelines included suggestions to provide multiple formats or mediums of communication such as community meetings and written materials translated into the appropriate languages to ensure that the information was made available to all community members.

In addition, ITK recommends that the researcher solicit requests from the community regarding the particular information about the topic in question that is of interest and of need to the community. Throughout the field season the researcher requested feedback on this particular aspect by including a question in the interview guide regarding future research and follow up information that would be of interest to the community. Requests for the types and format of information from this research provided to the community via the follow up session or research dissemination were obtained through communications with the Nunatsiavut Research Advisor, prior to the return trip.

During the follow up visit in May 2009, the researcher prepared a number of written and printed materials that were disseminated throughout the community. These included a written report summarizing the main research findings that was translated into Inuktitut and copies made available at the Inuit Community Government office as well as at the Nunatsiavut Government Administrative building in Hopedale. This report was also given to the Inuit Research Committee in Nain and to the Nunatsiavut Department's of Lands and Resources as well as the Department of Renewable Resources in Goose Bay. Secondly, a poster was also prepared and four copies were posted throughout the community to provide a visual communication tool regarding the

research in the community. This poster was also printed out in a pamphlet format, translated and mailed to each house in the community, including 17 Inuktitut speaking households.

While in Hopedale on the follow up visit, the researcher made house visits to meet with a number of the research participants. During these visits she explained and sought feedback on the research results and also communicated the results with them. As the researcher met with Hopedale residents she informed them where they can locate the research report in the community. Also during the visit, the researcher obtained a time slot on the local radio to provide a summary of the research and to invite Hopedale residents to call into the show with questions or contact her while she was in town. Although there were no calls received through the radio presentation, it provided the opportunity to inform residents of the research and to inform the community to approach the researcher while she was in town if they had any questions or wanted to provide feedback. The researcher also held a public open house during the follow up visit to allow residents to ask questions about the research. The open house also included an informal presentation and printed materials were made available. Forms were provided at the open house to allow attendees to provide feedback anonymously. Although the researcher did not expect a high attendance, due to her familiarity with the community and formal meetings, five local residents attended and provided some feedback on the research. The overwhelming feedback received by the researcher was primarily an appreciation for returning to the community after the completion of the research. The community was welcoming to the researcher and seemed to appreciate her efforts to follow up with Hopedale residents on a personal level simply by stopping by their house while in town and catching up. These discussions also allowed the researcher to become informed of recent changes or events that had taken place in the community over the past year.

4.2.1 Cross-Cultural Research

Conducting research in a cross-cultural environment presents any research project or researcher with challenges to address during the research process. The cultural setting of a research location involves subtle and overt cultural norms, behaviours and expectations that derive from a socially constructed set of values and beliefs. Equally, the researcher brings with them their own complex of cultural norms, perceptions, expectations and biases that inevitably influence their ‘positionality’ and interpretation of the research in all aspects (Mullings, 1999). Although the researcher attempts to achieve an unbiased, objective stance on the research, there is a need to acknowledge and attempt to address the potential influence of these perspectives in the results and process of the research itself (Ford *et al.*, 2008).

In the case of this research, the researcher came from a cultural point of view different from that of the community as a person native to southern Ontario with minimal exposure to northern communities, hunting or fishing and also an individual who, prior to conducting the field season, abstained from consuming meat and meat products in their personal diet. Maintaining awareness throughout the research process of inherent differences between the researcher’s worldview and the research ‘subjects’ worldview and establishing a respect for those differences from the outset of the research project was key (Marshall & Batten, 2004). This was exercised by the researcher by becoming aware of the cultural and historical climate of the region through preliminary research and through the initial field visit which helped her become acclimatized to the cultural setting. Further, participation of the researcher in local activities while in the community allowed for opportunities to better understand the meaning and significance of local cultural norms and practices that might not be understood otherwise. Discussed in section 4.2.2., participant observation, the researcher actively sought out and

participated in such opportunities, including consuming local wild meats and fish when the opportunity was presented to express her respect and interest in local practises while in the community. Meeting with community leaders within the local Nunatsiavut government prior to the field season further instilled a sense of obligation and responsibility on the part of the researcher to recognize and respect the traditional, cultural and linguistic attributes of the region. The researcher followed up on these concerns by ensuring that the research did not prioritize English speaking residents as participants, but collaborating with a local interpreter fluent in Inuktitut to make the research accessible to all residents.

Research in a cross-cultural setting involves adopting a sensitive approach in the research design, approach and execution (Marshall & Batten, 2004). Regardless of the efforts and intentions of the researcher to maintain an open, non-judgemental approach during the research experience, it is not assumed that the researcher's perspective or bias is entirely removed from the data or analysis of this research.

In addition to linguistic or conceptual differences, cross-cultural research can also involve different 'world-views' or knowledge systems. Indicated earlier, there was a western-scientific, southern worldview as well as a Labrador Inuit worldview involved in this research. In the case of Nunatsiavut, Labrador Inuit Knowledge is a highly valued knowledge system that underlies much of Hopedale resident's outlook and point of view. Although it is recognized that this knowledge system will inherently be part of adaptation, Nunatsiavut government makes it explicit that particular attention is needed in the area of integrating local and traditional knowledge or Labrador Inuit Knowledge into resource management planning and policy (Nunatsiavut Government, 2008). Acknowledging the role and importance of Labrador Inuit Knowledge throughout the data gathering and analysis further enhances the researcher's

understanding of the worldview of Hopedale residents and potentially allows for more appropriate analysis of the data and research findings.

In order to ensure that the research design and methods are appropriate for the research setting, particularly in a cross-cultural setting, ethical considerations and approvals must be established prior to conducting the research. The process of obtaining ethics approvals for this research is discussed in the next section.

4.2.2 Ethical Considerations

Gathering data involving human participants requires astute observation of ethical boundaries and concerns. Using the ethical research guidelines upheld by the University of Guelph Research Ethics Board, this research followed the required ethical protocol during all phases of the research including obtaining approval on the research guide and on the methods used throughout the research process. The research conducted for this research involved participants who were potentially ‘vulnerable’ including elders, historically marginalized aboriginal people and individuals whose first language was not English. This required that the researcher take additional steps for obtaining consent such as using an interpreter, providing a translated consent form, allowed for verbal consent and providing verbal confirmation of confidentiality and the choice to remain an anonymous participant. The researcher remained vigilant throughout the research to ensure that her interactions with and representations of community members whether or not research participants was in keeping with ethical research guidelines.

4.3 Data Gathering Methods

A multiple method approach for gathering data was applied to allow for a robust data set and to succeed in triangulating identified patterns and relationships (Mason, 2002). The methods utilized in this research involved open-ended, semi-structured interviews, key-informant interviews, a questionnaire, participant observation and analysis of pertinent secondary sources. The rationale for the use of these methods to achieve the thesis research objectives are discussed in turn in the following section beginning with interviews.

4.3.1 Interviews

A total of 55 interviews were conducted in the field between the period of May 5th and July 15th, 2008. Two groups of interviewees were selected for interviews. Forty ‘community-based’ interviews involved mainly experienced hunters, fishers and gatherers of Hopedale. Fifteen ‘key informant’ interviews were conducted mainly with representatives from relevant natural resource management departments and institutions, governing bodies such as the local Inuit Government, the Nunatsiavut Government and the former governing institution in Labrador, the Labrador Inuit Association (LIA). Interviews were selected for this research for a number of reasons.

Interviewing is a research method that is useful in facilitating open discussion guided by key research themes and allows for new directions and interpretation of the research material which is particularly useful in a cross-cultural research setting (Flowerdew & Martin, 2005). Interviews were particularly appropriate in an Inuit community setting as Inuit communication is traditionally oral as opposed to in a written format (Soukup, 2006). Open ended, informal discussions held in a participant’s kitchen or family room helped to ensure their comfort and ease

with the researcher. Semi-structured interviews allowed interviewees to express their perceptions and experiences in an open dialogue and to allow for conversation and while also ensuring direction of the discussion based on key themes initiated by the researcher (Flowerdew & Martin, 2005).

The interview questions were designed to fulfil elements of all four research objectives. Two separate, but similar interview guides were created based on similar themes of resource use, local and traditional knowledge, environmental and other changes as well as governance structure and organization (Appendix B and C). The two groups were divided by community-based interviews and key informant interviews. These are explained in further detail below.

4.3.2 Community-Based Interviews

Interviews conducted in the community of Hopedale are described here as community-based interviews. Participants were selected from an initial list provided by the hired research assistants, which included mainly active fishers and hunters. From this list, the researcher contacted participants by phone from the local hotel lobby to request their participation in the research. From these interviews, other residents were suggested by interview participants who were often the relatives or friends of the participants. When the formal nature of a phone call to local residents appeared to deter residents from their involvement, the researcher sought to approach individuals in the community directly. The researcher established a routine of taking a walk around the community at least one or twice daily. After a few days of these walks around the community, individuals began to approach her about the purpose for her being in the community and from this interaction often individuals became interested and agreed to participate in interviews. Again from these interviews, additional names were suggested for the

researcher to contact based on their participation in hunting and fishing activities or their experience level with the land and sea. Beyond these methods, the researcher also made an announcement on the local radio station regarding the research to inform the community of the research project and to solicit interested residents for an interview. In addition, a sign was placed in the local store and post office regarding the research. The decision to offer a monetary stipend to participants was based on a number of factors and was not without reservation. The researcher was aware that offering a monetary stipend was an increasingly customary practise for research conducted in the Arctic in particular, where Inuit research participants have gained more influence and say in the research conducted in their communities (ITK & NRI, 2007). Finally, the researcher valued the time and the lost opportunity cost of a hunter or fishers' time that was sacrificed to participate in an interview and felt that participants should be compensated for their time. There were in fact several participants who declined the stipend stating that they did not need it and those participants tended to be individuals with steady employment and income. Many interview participants also stated that they preferred not to accept monetary compensation for their time and that they gladly wanted to contribute to the research, but that out of need, were appreciative of the stipend. An effort was made to select a balance of interviewees who were actively engaged in hunting and harvesting activities who tended to be adult males, as well as women and elder participants. Out of a total of 40 community-based interview participants there were 12 female including 4 female elders as well as 7 male elders. The remaining participants identified under the 'other' category in figure 4.1, included adult male and female participants.

The focus of these interviews was largely influenced by the first, second and third research objectives. The questions first sought to identify and understand the vulnerabilities in Hopedale. This was achieved by inquiring about resource use, importance and change. Later

questions about management of resources sought to understand resident's interaction with and awareness of the management institutions that related to those resources they identified as being important. The researcher also inquired about the management of resources in the community such as practises or expectations of behaviour amongst residents towards resources and the land and sea. These questions were designed to understand how, when and where resources are harvested and also used within the community to understand which resources were important and whether this had changed at all. Finally, the interviews led to discussion about participant's involvement in decision making to understand from the community point of view, the structure and interactions of governance systems and also the role of Labrador Inuit Knowledge in decision making in terms of involvement in decision making, accessibility to key institutions and actors and the nature of interactions between the individuals, the community and governance structures beyond the community scale.

4.3.3 Key Informant Interviews

Key informant interviews were used primarily to obtain an informed perspective on the current nature of governance structures and decision making processes as well as the role of Labrador Inuit Knowledge (Flowerdew & Martin, 2005). Selection of interviewees was decided on the basis of their position within relevant organizations and institutions including for example the Nunatsiavut Department of Lands and Natural Resources, the Torngat Joint Fisheries Management Board, Torngat Plants & Wildlife Co-Management Board, the Newfoundland and Labrador Department of Wildlife Conservation. A snowball approach was used to identify additional suitable candidates.

The researcher used these interviews to further understand the role and responsibilities of the institution or organization with regards to the management of key resources identified by the community. Interview questions were also based on the themes of climate change (perceptions, actions), opportunities and constraints to facilitating adaptation plans within the current structures of decision making and how Labrador Inuit Knowledge was perceived and whether it was involved in existing decision making. These interviews were also used to inquire about the interactions between institutions pertaining to the identified vulnerabilities, to identify capacities or constraints that might influence the facilitation of adaptation initiatives.

	Total Interviewed	Male	Female	Elder	Other
Community- Based	40	28	12	11	29
Key Informant	15	10	5	1	14

Table 4.1 Interview Participant Demographics.

4.4. Participant Observation

Participant observation can be a revealing and rich approach to gathering data, particularly in a cross-cultural setting, to further interpreting research findings through interviews and surveys. The involvement of the researcher within the community in local events or activities not only improved the level of understanding of the community by the researcher, but encourages a sense of trust between the researcher and the community, namely the research participants. In the case of this research project, the researcher moved to the community for a period of just over two months from May to mid July. During this time, the researcher shopped at the same store as local residents, participated in the local bingo, joined in a weekly women's

sewing group and traveled out on the land and sea with local residents to fish, gather eggs and visit residents' nearby cabins.

Through these activities, residents were able to become more familiar with the researcher as a person and a more trusting relationship between the researcher and the community was rendered. Participant observation was adopted to mainly develop familiarity with the context of the interviewees' responses but also to get to know people in the community and demonstrate her interest in local activities and entertainment. For example, many responses regarding hunting and fishing focused on the importance of certain locations that required accessing them by boat. By inquiring with her neighbours about the opportunity to join a fishing excursion one day and also contributing a portion of the gas for the boat and bringing her own snacks or grub, the researcher became familiar with the expectations and necessary customs involved in joining others when going off on boat. Another activity that the researcher was able to join in with was the local weekly women's sewing group. This gathering took place each week in the local safe house which was a building that was only open to women in the community, primarily women who were in need of assistance or protection, often as a result of circumstances with their spouse or family. This sewing group allowed women to get together to learn or teach other women to sew traditional slippers, quilts and other handicrafts. These were later sold in the community or along the coast to help raise funds for the safe house. This gathering was an opportunity for the researcher to meet and discuss local events or issues explicitly from the perspective of women in Hopedale. The conversations with these women helped the researcher better understand the community from their perspective and also become better acquainted with local issues. Through two months of experiences such as these, the researcher was able to gain a more comprehensive understanding of the context of the research and ultimately of the community.

4.5 Survey

A short survey was also conducted in Hopedale to obtain insight into the nature of the community identified vulnerabilities pertaining to wildlife and other resources. The survey included five open-ended questions and was particularly focused on which resources were valued in the community, whether there had been any changes to those resources and the extent to which the community played a role in managing resources (Appendix E). The survey was administered at the Hopedale community hall during the weekly bingo session to approximately 20 attendants and was completed by 16 respondents. The weekly bingo session was identified as a suitable forum for administering the survey as the Provincial Health Department regularly conducts health surveys during this community gathering and therefore provided an opportunity to include a research method that the community was well accustomed to. The bingo session is favoured by residents for the food prizes given to the bingo winners. As the host of the bingo session, the researcher followed the custom with the bingo session and prepared plates of baked goods with the research assistants in addition to store bought foods to assemble the winning food prizes. Notices were posted in the community at the local store, Inuit Community Government and in the community hall a week prior to the event. The researcher also announced the event on the local radio station.

The survey results were used to compare against the findings from the interviews and secondary sources. The survey was designed to ask explicitly about resource use, availability and management. However, due to the relatively small number of responses, the results were not substantial or comprehensive enough to rely on alone. The results from the survey, however, proved useful in further supporting some of the findings that emerged through the interviews as well as the researcher's exercises of participation observation.

4.6 Secondary Source Analysis

Secondary sources were used for several purposes. Secondary sources were consulted to some extent in the process of meeting each of the four research objectives. The sources consulted included previously conducted vulnerability assessments, socio-economic reports of Newfoundland and Labrador such as Statistic Canada reports. A review of secondary sources such as the Nunatsiavut Land claims Agreement, the Labrador Inuit Constitutions, the Department of Fisheries and Oceans website, and the Labrador Climate Change Action Plan was also completed. These sources were used to obtain detailed information regarding existing governance structures, key institutions, management responsibilities and locations and names of various departments and stakeholders. The process of reviewing these sources in addition to a number of others allowed the researcher to identify suitable departments, organizations and stakeholders to consult for the purposes of in person interviews to discuss the broader themes of the research. Secondary sources such as the Labrador Inuit Land Claims Agreement proved to be crucial sources of information for achieving the objectives of this thesis.

4.7 Data Analysis

Following the collection data through interviews, participant observation, survey and secondary sources, the data were then analyzed. Interviews were either digitally recorded or recorded through note taking at the request of the interviewee. Field notes were also developed based on observations made by the researcher during and after interviews. All interviews were manually transcribed by the researcher and then analyzed and categorized. The approach taken to categorize and analyze the data involved three main steps, following the methods of analysis suggested by Mason (2002). The data were initially sorted and categorized using a content

analysis process to capture the context, cultural and language meaning behind the interview discussions. Upon completion of data collection, the data were further sorted then coded and categorized into themes and sub-themes based on the research objectives including vulnerabilities; governance systems and structures; knowledge systems; and integrating opportunities. Some examples of the sub-themes included social, political, environmental, and economic vulnerabilities; governance processes, interactions and participation of the community in formal governance processes as well as knowledge perceptions, interpretations and integration within governance systems. As data were collected through community-based and key informant interviews, secondary sources and observations the data were compared, interpreted and analyzed through an iterative process to find common themes pertaining to each of the four research objectives. After these themes were determined, specific quotations from interviews were identified to provide examples of the meaning behind these themes from the perspective of the interview participants. The results of this process of data analysis are outlined in the following chapters five and six.

CHAPTER FIVE

CURRENT & FUTURE VULNERABILITIES

5.1 Hopedale Vulnerabilities

As outlined in chapter two, vulnerabilities are a reflection of a system's current exposure-sensitivities and the capacity of that system to adapt or cope. To summarize Hopedale's vulnerabilities and better understand how adaptive capacity might be enhanced, this research sought to review existing publications regarding the community's vulnerability and also further investigate, through primary data collection, the specific attributes of the community's key vulnerabilities. Through further investigation of these attributes, a better understanding of how and where institutions and Labrador Inuit Knowledge could enhance adaptive capacity was achieved. Hopedale is currently subject to a range of vulnerabilities which arise as a result of environmental, social, political, cultural and economic circumstances (See Figure 5.1) and subsequently, as discussed in chapter six, adaptation requires the involvement of a number of institutions. The main vulnerabilities, both current and future, as well as existing adaptive strategies and capacities are discussed at length below.

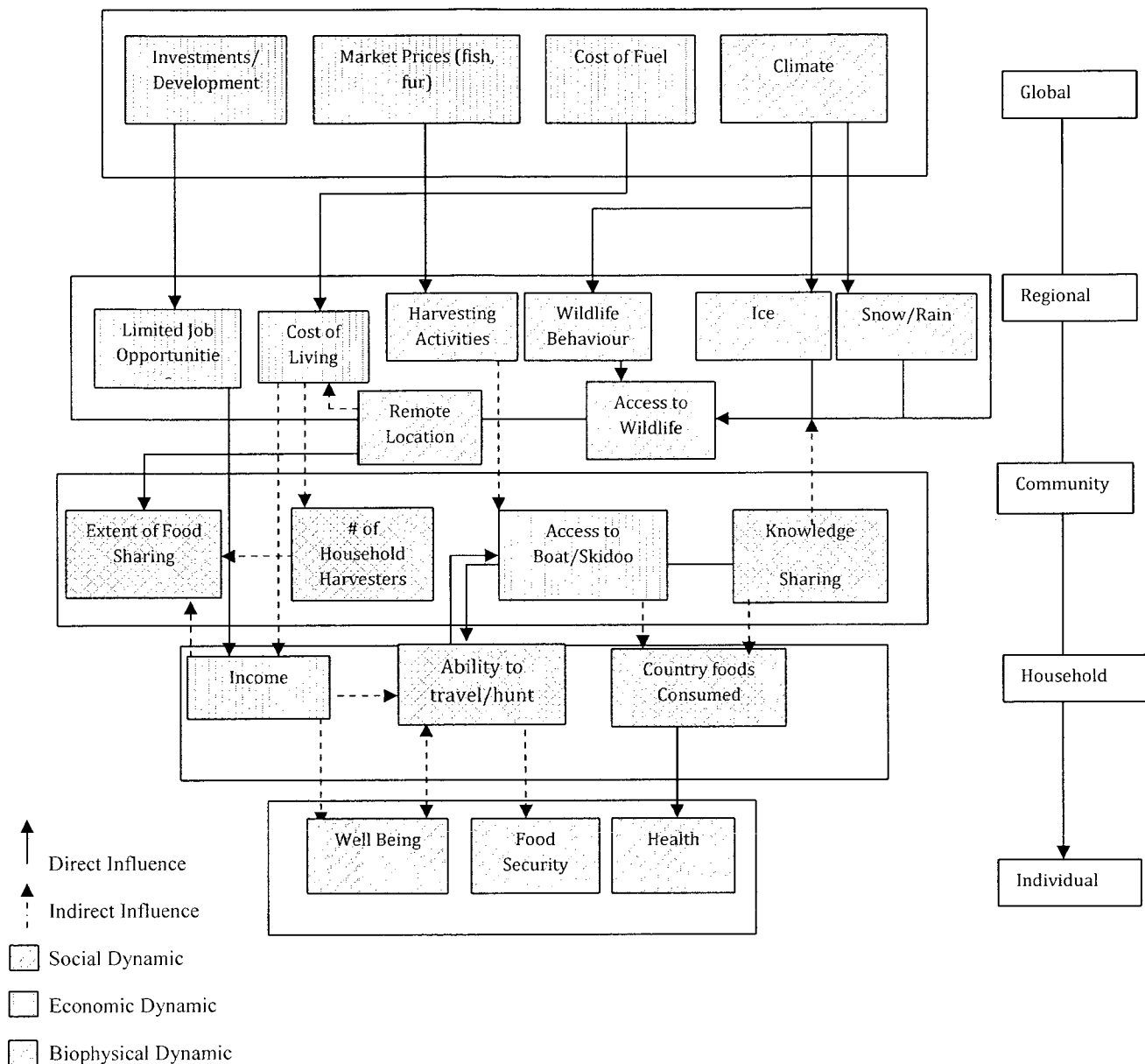


Figure 5.1 Conceptualization of interrelated vulnerabilities in Hopedale, Nunatsiavut.

5.2 Current Vulnerabilities

As a primarily resource-based community, Hopedale residents are particularly exposed and sensitive to changes in ecosystems. These changes however are experienced in addition to a

number of non-ecosystem based changes which contributes to the complexity of identifying specific adaptation interventions. A number of vulnerabilities were identified and these have been summarized into five main exposures;

- Changes to accessibility & availability of wildlife and other resources;
- Changing sharing networks;
- Limited employment and investment prospects;
- Increasing costs of living;
- Changes to governance systems.

These exposures, discussed below, are influenced by seasonal climatic conditions and related wildlife and ecosystem activities and also by socio-economic and political circumstances (Figure 5.1). The biophysical conditions affecting access and availability of wildlife identified included sea and land ice conditions, snow quantity and duration, wind strength, seasonal temperature and changing animal behaviour. These findings are in keeping with findings throughout Labrador coastal communities (Furgal *et al*, 2002; DeSantis, 2008; Johnson *et al*, 2005; Nickels *et al*, 2006). Scarce employment opportunities, limited access to necessary transportation means such as boats or skidoos, compromised sharing networks and significant political change have also influenced Hopedale's vulnerability. Through this summary of vulnerabilities experienced in Hopedale, the underlying capacities and constraints to adaptation are identified and further explored in the following chapter. The following section summarizes the five main exposures.

5.2.1 Changes to Accessibility & Availability of Wildlife

Findings from community interviews revealed that community members were sensitive to changes in seasonal ice conditions. Most seasonal activities undertaken by Hopedale residents are dictated by the timing and conditions of sea and land-based ice. In winter, travel and hunting seasons are determined by the assurance of safe, thick ice conditions. In spring and fall the timing of fishing, bird and egg hunting as well as seal hunting are also determined by the seasonal break up of land and sea ice. For centuries, Inuit of Labrador have relied on these seasonal changes in sea and land ice (Brice-Bennett, 1977). The present day lives of Labrador Inuit are not significantly different. Despite this familiarity with seasonal changes, recent irregularities in freeze up and opening timing over the past two decades have led to increased challenges and changes for Hopedale residents.

According to all Hopedale residents interviewed, the sea ice that surrounds Hopedale has been noticeably retreating earlier and freezing up later over the past few decades. This is consistent with measurements of seasonal sea ice extent off the nearby coast of Newfoundland which show a consistent decrease (Figure 5.2). There was a consensus among most interviewees that ice conditions have become less reliable and quite different than in the past.

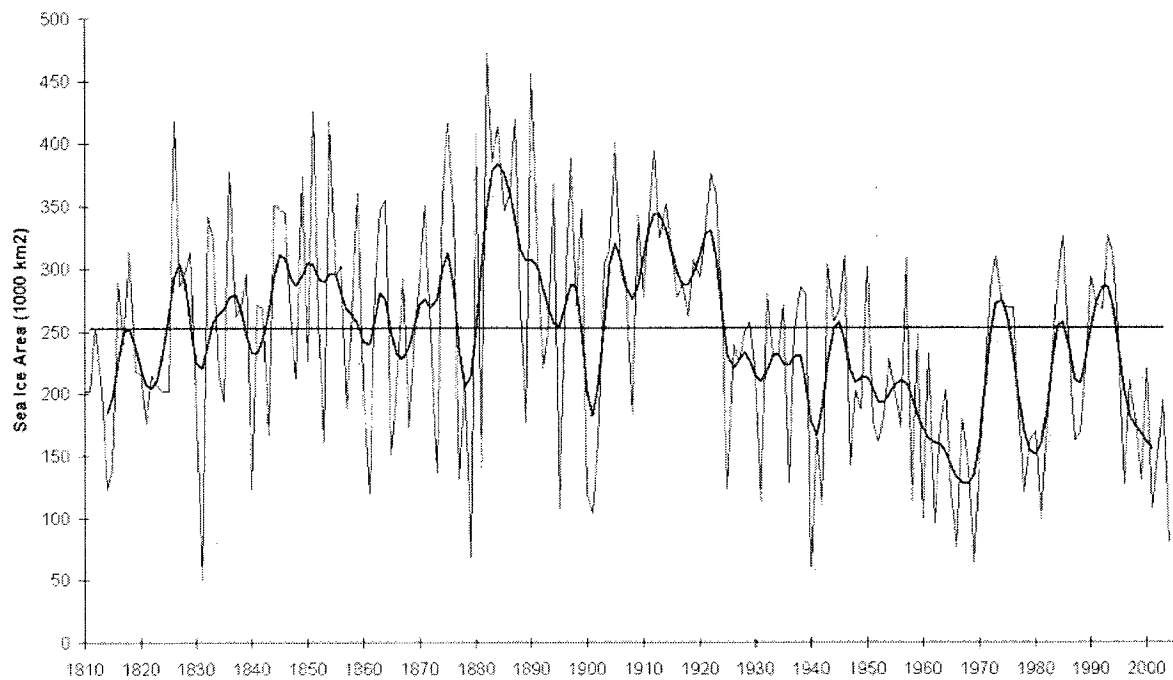


Figure 5.2 Winter sea ice extent changes off Newfoundland 1810-2000 (Hill, 1999).

Residents interviewed agreed when discussing the spring thawing and opening up of the bay, that over the past ten years there has been a shift in the timing of the opening and freezing of the bay. For both the spring and fall, residents note a change by approximately one month. One resident reflects on these changes.

For the last few years we've been in boat end of May, early June, which is unusual... It was the 15th of June we were about 23 miles out off Hopedale hunting seal on Skidoo...ya, that was probably 1991, 1992. And now by mid May, usually we're finished skidooing now.
-Hopedale Resident

Similarly, residents have noticed changes in conditions to ice in the fall season. Many residents discussed how similar to the spring season, the fall has also been exhibiting a later freeze up timing by roughly one month, or longer according to some.

In the Fall I noticed a big difference in fall, when we were kids we used to go off and skate on ponds in October, on pond ice, now you never see that. Maybe late November early December. It's almost a month's difference now I notice from before.

-Hopedale Hunter

The changes in sea ice timing observed by Hopedale residents are consistent with recent research findings (Johnson *et al.*, 2005). Other studies have revealed a decline in sea ice coverage over roughly the same ten year period from 1996- 2002. This period has been described as consistent 'light ice years' (Johnson, *et al.*, 2005). Ice conditions in both the fresh water lakes and rivers and the sea influence Hopedale resident's ability to travel to ideal hunting and wood gathering locations during the winter and spring months. The timing of hunting seasons has changed according to some hunters due to the changing snow and ice conditions. This is supported by an active hunter in Hopedale who commented about the caribou hunt:

Ya, because when the early 90's when I was here at Christmas, on Christmas break we could always go caribou hunting. But now the ice is not good enough at Christmas time to get in the country, cause you can't travel between here and there, because it's usually late January. So there's a shift that way, see.

-Hopedale Hunter

Ice is important for travel in general during the winter months which serve as a means to transportation and greatly enhances the square footage for travel and activities for the residents of this remote community. This was most evident during the lull between seasons for example when residents, particularly hunters and fishers, are anxiously awaiting the transition of the seasons and can be found actively preparing for the next season's activities. During the late spring season for example, most hunters and fishers are busy repairing boats or fishing nets or chopping large logs for firewood or for komatiks to be used the following winter. The time period when the sea ice is freezing over or thawing and when snow fall is retreating, restricts residents activities to within the community. The impression of this transition in the community

is one of anticipation and frustration as travel on either snow machines or boats is not feasible. Transportation over frozen sea ice is important for traveling to winter cabins on weekends which is an activity that residents look forward to and is a source of entertainment and family get-togethers. The ice 'roadways' also allow for travel between communities and to important hunting areas via snow machines along the coast which would otherwise be impossible as no roads exist between or outside the coastal communities. In addition to ice, snow conditions are also important for traveling by snow machine as the snow provides the necessary traction that moves snow machines. When there is unfavourable ice or snow conditions residents' freedom to travel to and participate in various hunting, traveling and leisure activities is significantly influenced.

Harder to get up on the land where you want to go with skidoo when there is no snow, you gotta take chain saws wherever you go to get up on the land I guess... The boys went caribou hunting last year had to make a path to get into the caribou grounds
-Hopedale Hunter

Adequate snow depth is required in order for a snow machine to be able to travel over land smoothly. Residents commented on the changes in snow fall volume and snow melt. Although the snowfall may not have changed drastically, the timing of snowmelt in the spring has changed and made for a shorter skidoo season in late winter. The earlier timing of snowmelt observed by Hopedale residents is similar to the changes in timing of snowmelt occurring elsewhere in the Eastern and Western Arctic (Figure 5.3).

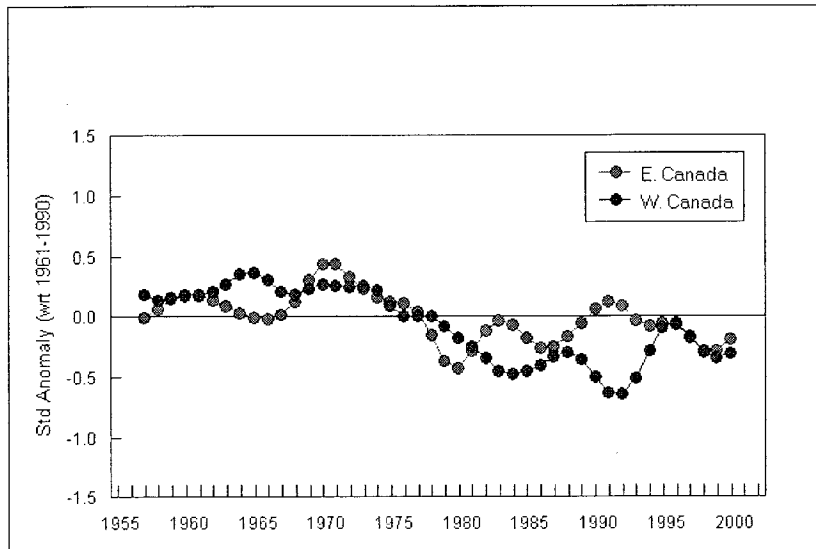


Figure 5.3 End date of continuous snow cover Eastern Canada 1961-1990 (Brown, 2003).

When there is insufficient snow on the ground, snow machines can break down. Without another means of travel during these months, a broken down snow machine can be a significant loss. Replacement parts for both snow machines and boats in the summer are often difficult to obtain due to the remoteness of Hopedale, limited accessibility to specialized stores and also the time and expense involved in having packages delivered by mail when ordered on-line for example. The instability of ice and snow cover during the melting season creates a waiting period during which travel on the sea or land is risky if even possible. This timing presents new stresses when it comes earlier each year and reduces the time for travel in the land via snow machine before the ice in the bays has cleared enough to begin putting boats in the water.

As illustrated in the conceptual diagram, Figure 5.1., access to a boat or skidoo is influenced by a number of factors. Public transportation is unavailable in the community with the exception of two airlines that service the northern coast from Goose Bay; Innu Mikun and Air Labrador. Having one's own means to travel within town and out on the land is therefore beneficial and highly valued in the community. Those who have access to a snow machine or

boat are often the household hunters, trappers, or gatherers. In some instances, these individuals are the community hunters. Not all households participate in the annual caribou hunt and therefore rely on other community members who have the time and resources to participate in the annual hunt. This has become increasingly common in recent years with respect to the caribou hunt. In the last 5 years or more, caribou have become increasingly challenging to obtain due to their location being further away from Hopedale, and also due to the rising costs associated with the hunt. Hunters in Hopedale are used to travelling outside the community area for caribou due to the migratory nature of caribou herds. Further travel to reach caribou grounds from Hopedale which requires more gas and more supplies for the trip, in conjunction with increasing cost of fuel however, have contributed to fewer residents partaking in the hunt, and potentially less caribou meat coming into the community. As a result, those who do make the trip obtain caribou meat for their own households, but also anticipate sharing their harvest with others in their family and in the community. The actual amount of caribou meat that can be brought back to the community is also limited by the capacity of the *Komatiks*, the wooden sleds pulled behind snow machines, (Figure 5.4) used to haul the meat from the land back to the community. The increasingly high costs associated with the hunt and the decreased amount of meat in the community is putting a strain on the willingness of some residents to share large quantities of meat with other residents.

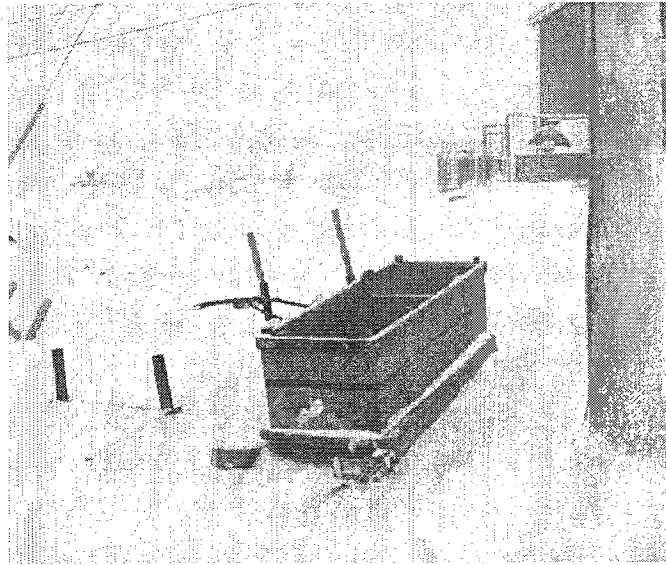


Figure 5.4 Wooden *Komatik* used to haul resources behind snow machines.

Additional changes have been observed in wildlife availability in terms of the timing and quality of resources. Hunters note that caribou are travelling more due to changing climatic conditions, and are carrying less fat and therefore the taste is not as good. Char behaviour is also changing according to some Hopedale residents. Residents noted that char are emerging out from brooks earlier and are less abundant in some areas. These observations may reflect predicted climate change impacts on Arctic fisheries (Reist *et al*, 2006). According to several residents, migratory birds in particular are being over harvested by some individuals and some areas are not as abundant as in previous years. For example, certain islands around the community are known as islands where migratory birds revisit each spring to lay eggs. These islands are where residents travel to for egg gathering and goose and duck hunting. It was suggested by respondents that some islands which have previously been abundant in goose, duck and seagull nests, have become more sparse due to the previous year's harvesting activities in that particular area. Despite these observed changes, respondents were confident that birds had simply avoided those particular islands and were finding other islands to nest on in following years. It was also

stated, however, by one elder respondent that they don't see the flocks of birds around Hopedale like they did during their youth. This observation suggests that abundance levels of migratory birds may have changed over a longer period, but from year to year the numbers appear relatively consistent.

Hunters more actively involved in hunting seal commented that seal pups are becoming threatened by changing sea ice conditions. Experienced seal hunters, those who still hunt seal mainly for dog feed, explain that the ice has become too thin at the time of seal rearing for seal pups to be supported on the ice platforms as needed. Although the community does not rely on seal for wild meat sources as it once did, there are members of the community who continue to harvest seals for their meat and for the seal skins. One elder female of the community continues to clean seal and other skins such as polar bear for hunters who harvest them. Some hunters harvesting seals for mainly the meat will give her the skins of the ones they harvest from which she is able to clean and stretch them and also make seal skin boots and mitts. These are sold within the community and to Nunatsiavut residents and elsewhere in Labrador. A reduction in the availability of seals may impact these traditional activities within the community in the future.

Finally, salmon has become less abundant according to some hunters and fishers, who suggest that the seasonal quotas should in fact be reduced from the current maximum of four down to two salmon per resident per season. Others, however, suggest that salmon is just as abundant as it has been and there is no need to make adjustments to harvest levels, and that four salmon per person is far too low, and that more could be harvested sustainably. These changes being experienced and observed by Hopedale residents are not only influencing the accessibility

and availability of certain valuable resources, but they are also contributing to constraints within traditional community sharing networks.

5.2.2 Changes in Sharing Networks

Sharing country food and other country resources such as firewood has been an historical social norm in Hopedale and surrounding communities that continues to be the case today. Despite the longevity of these sharing networks, recent stresses in the community are contributing to some changes in the extent and operation of sharing networks in Hopedale. Historically, community members shared all the resources that were harvested. Elders who were interviewed spoke of a time in the past when a hunter would return to the community after a seal hunt to divide up the animal at the dock and people would run down to the dock to get their share. Although not as much seal meat is harvested or consumed today, the sharing of country meat and other resources such as caribou, migratory birds and fish has continued to be an expectation and custom amongst members in the community. It is important to note that the countryfoods that are consumed and enjoyed by residents in Hopedale span a range of different types of resources. There is value in all countryfoods or wild foods in general, rather than a preference for one resource in particular. The appreciation for a range of countryfoods adds to the constraints within in sharing countryfoods. Residents are not concerned, for example, about obtaining only caribou meat, but find it important to harvest or at least consume if they are unable to hunt them themselves, the range of countryfoods that are traditionally hunted and gathered. As more than one respondent suggested,

“All wild meats are important, cause we live off the land” -Hopedale resident

This resident reflects how harvesting and consuming country foods is not simply about food sources but rather is tied to a greater lifestyle and identity with the land and its resources. This is reflected in the survey responses from residents regarding which resources were considered important to them (Table 5.1). Although certain resources were highlighted by some, the majority of the responses indicated that all resources were important.

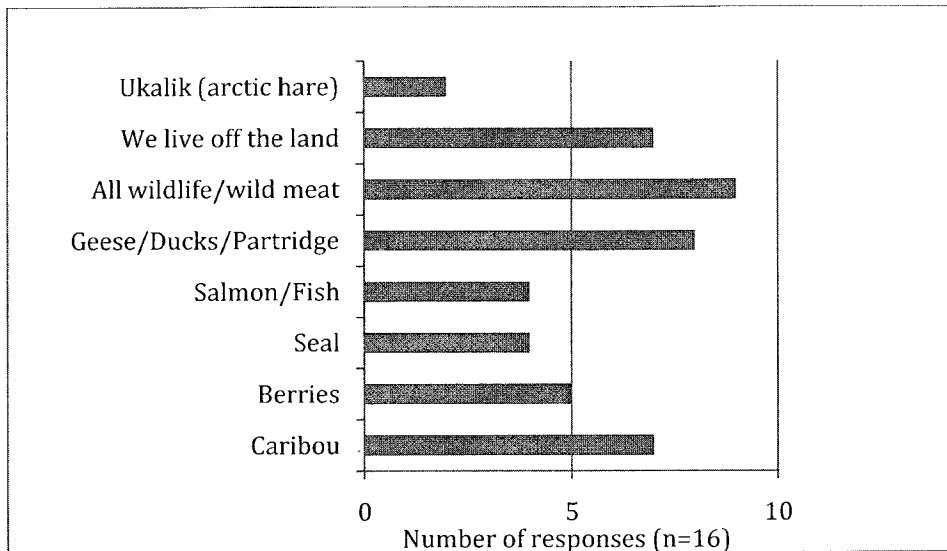


Table 5.1 Harvested resources identified as important by Hopedale residents.

It is a common expectation amongst community members that people will share their country food. Some examples of these foods include dried or smoked fish, seagull or goose eggs and caribou meat (Figure 5.4).

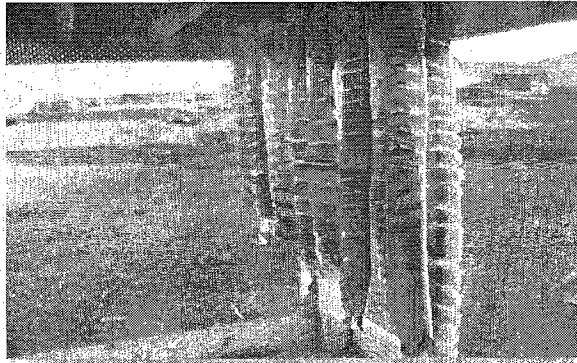


Figure 5.5 Pipsik or dried fish drying in front of Hopedale resident's home.

As evident through roughly half of the community-based interviews, people are willing to share their meat if people ask for it, by giving them a phone call, or asking them in person.

What I usually do is just gets a couple, some friends around town, just gives them a call or something let them know if they've got some, we'd like some..... They just give us some, if we want some more, we just ask for it.
-Hopedale Resident

People share more willingly with their immediate and extended family and close friends or neighbours. While nearly all respondents indicated that they will share with someone if they were to ask for it, some residents are also less willing to share with someone who is physically able to obtain their own meat, but does not hunt/fish for themselves.

None of this, you know, give, give. He's got two solid arms, two solid legs, why can't he go out and get his own, you don't put out your neck, you ain't gonna get nothing, I'm not going to give you nothing.
-Hopedale Resident

Sharing networks, while not a perfect system, have historically ensured a constant supply of highly valuable resources for local residents. These systems are perhaps beginning to feel a strain due not only to changes in environmental conditions, but changes in economic circumstances as well.

5.2.3 Limited Employment Opportunities

Since the decline of the cod fishery in Labrador, Hopedale has been experiencing challenges with respect to both adequate employment as well as investment opportunities in the community. The employment opportunities that do exist in the community are mainly with government department, the school and the local store. The two main prospects for employment both involve migrating out of Hopedale either seasonally or permanently. These are the opportunities made available through the Voisey's Bay Nickel Mining Company, owned by Vale Inco, as well as opportunities outside Hopedale in Churchill Falls, Labrador City and St. John's where there are significantly more resource development projects and industries. Residents commented on the concerns that while the other communities within Nunatsiavut have experienced investments in resource developments such as the fish processing plants in Nain and up until 2008 in Postville, Hopedale has not. One of explanation suggested was that the southern communities of Rigolet are at an advantage due to their proximity to the more industrial and populated Goose Bay.

You got Nain north of us, you got Rigolet, Makkovik south, Postville south of us, then you got Natwashish. So I mean, job wise... they're hitting all the resources and we're stuck in the middle. It seems like when something happens, we don't get much opportunities that come along.
-Hopedale Hunter

The limited amount of opportunities available has some residents concerns for their children's opportunities in future, and their ability to remain in Hopedale and build a life there.

it's hard for people here to get jobs, they'd have to actually leave the community to try to find- there's not much here employment, and what's already there, it's already been taken up by other people... young people growing up have got the opportunity now with their education paid for to do something – but- they pick something that's not here, they've got to stay outside and make their money, they pick something that's here, it's already taken, so basically we're losing our young people.

-Hopedale Hunter

5.2.4 Increasing Costs of Living

The cost of living on the remote northern coast of Labrador is high. Food either purchased at the store or obtained through harvesting activities is expensive due to the gas and equipment such as a snow machine or boat required to obtain country food. For those purchasing store bought foods, quality healthy foods in particular such as fresh and frozen fruit, vegetables, dairy products and lean meats are exceptionally expensive. Although a food subsidy is applied to the price of foods available in the town store to account for the costs of shipping the goods up the coast, the impact on the overall price of store foods is minimal. As a result, people often chose lower priced and lower quality foods to make the most of their food dollars.

A main cause of the increasing costs of living in Hopedale stems from the price of fuel. Gas is required to travel on land in winter on skidoo and in the spring and summer on the sea on boat. As mentioned, transportation is highly valued by Hopedale residents due to its ability to essentially increase the living space of the community and facilitate access to important hunting and fishing activities. Transportation within and nearby the community is also a main form of activity and entertainment for families and friends. ‘Going off’ on the land or to the cabin during the winter and summer is a very common weekend activity that most residents look forward to each week. The cost of gas also influences the price of heating one’s house as most residents of Hopedale burn fuel wood for heating and residents harvest their own wood. A specific type of wood referred to as ‘burn wood’ is preferred by Hopedale residents for its dryness and clean burning qualities. This type of wood has survived through a forest fire and therefore only selected stands of trees are accessed to harvest this type of wood. The immediate surrounding area of Hopedale is sparsely forested and the closest forested area containing burn wood is roughly 50 kilometres away. It has been easier and preferred in past to harvest a few sticks at a

time and make more trips to reduce the work load, as well as reduce the time needed to spend outside particularly during the extreme wind and cold of the Labrador Coast. Now with higher global costs of oil, the ability of Hopedale residents to participate in these activities and even meet basic daily needs (i.e. heating) is being compromised.

The increasing costs of living in addition to limited employment opportunities are contributing to especially challenging circumstances for some residents of Hopedale. There is an issue of poor quality living conditions where in some cases, people's homes are without running water, they are living in overcrowded and in some cases in potentially contaminated households due to the situation of ground contamination in one of the subdivisions in town. Repairing homes is costly and due to the limited suitable land for building new homes and high demand for those that are improved or constructed, some people remain in housing conditions that are much less than ideal.

5.2.5 Changing Governance Systems

The new self-government has generally been received as a very positive step for the Labrador Inuit. It brought ownership of Labrador lands and resources to the Inuit of Labrador, preservation of Inuit language and culture among numerous other achievements. Despite these successes, some people are dissatisfied with the timing of the transition period, the delay in the implementation of platform promises and also in the accountability due to a lack of an opposition. Some Hopedale residents and other respondents from outside Hopedale feel that there have been some cases of empty promises and instances where the NG has gone back on initial platform items. One example mentioned was when funds that had initially been allotted for educational funding were used for an alternative purpose and then later replaced when some

concern was raised by Nunatsiavut beneficiaries. The transitional period has also raised some concerns for residents.

When the government was initially established in 2005, it was made clear by the Nunatsiavut Government that there would be a period of transition while the NG began to build and replace former provincial organizations with their own self-governed institutions (NG, 2008). While this process is currently taking place, it is now four years in to the transition of the NG and some residents are not satisfied with the progress that has and has not been made. One of the main concerns expressed was the lack of new and additional job opportunities that were expected with the transition to the new government. Residents also have concerns regarding how various departments are spending funds, and that is compounded by a sense of exclusion from meetings and decisions in the government. For example, there have been some costly training excursions in which several Nunatsiavut government employees have traveled to expensive destinations to receive training and education with the aim of developing specific skills or gaining exposure to new ideas related to their department. One example is a trip that members of the Nunatsiavut Tourism Board took to the Galapagos Islands in May of 2008 to learn about tourism strategies from a region with similar ecological and cultural attributes as Nunatsiavut. This trip was designed to ultimately introduce the Tourism Board to ideas that could be incorporated into their tourism industry development, which ultimately could increase job opportunities in the community. It is difficult for residents to appreciate the intentions behind this trip and others similar since they are not seeing the immediate benefit to the community and job development. The lack of awareness in the community of the ultimate goal of this type of training illustrates that communication between the community and the Nunatsiavut Government is strained. Even though information and updates about the activities of the NG are available on

the government website and are also often announced on the OKalaKatiget Society (OK) radio station and website, it is clear that these forums for communication are not reaching the community in all instances (OK Society, 2008). As a result, there is a disconnect between the NG and the community.

Similarly, concerns with the Inuit Community Government were also echoed by a few Hopedale residents. It was stated that often, despite what might be discussed by community members, ‘council does what it wants anyway’. There are two concerns that are raised here. Discussions tend to take place in the community in more intimate quarters within households and local community groups regarding proposed changes by the ICG such as ploughing the roads in spring. However, these concerns tend to remain within these circles of communication since as residents suggested, most are not accustomed to or comfortable with openly voicing their concerns at a town council meeting. The approach that most Hopedale residents interviewed took to deal with conflict or differences of opinion was rather indirect and subtle. This was evident during interviews with Hopedale residents as interviewees were hesitant when indicating strong opinions about a topic or issue. This approach to conflict is consistent with traditional Inuit conflict management and avoidance strategies where Inuit historically withheld their opinions for the sake of cohesion within the broader community (Briggs, 2000). Secondly, when the government proposes to make a change in the community they request that people come forward to express their objections or concerns. This approach appears to be in direct conflict with the apparent behaviour of many Hopedale residents regarding conflict. Whether this approach is based on traditional norms or expectations is not clear in this case, however, this example highlights a distinction between approaches to dealing with an issue in the community between the community and either the local or the regional government. This suggests opportunities to

enhance adaptive capacities through alternative approaches to decision making involving the community.

A related issue involves the governance approach of the Nunatsiavut Government. Despite being founded as an Inuit self-government, the Nunatsiavut Government has arguably been referred to in more than one interview, as another ‘white man’s’ government. There are few Inuktitut speaking leaders or members of the new government even though Inuktitut is an official language of the NG. One comment in particular that stood out was regarding the negotiations of the Land Claim Agreement, in which at least one of the lead negotiators was non-Inuit and was negotiating an Inuit Land Claims Agreement on behalf of Labrador Inuit. Concerns were also voiced by Nunatsiavut residents of Hopedale and elsewhere in Nunatsiavut regarding the use of the Inuktitut language in policy recommendations. For example, all recommendations for new policies or modifications to existing policies must be submitted to the Nunatsiavut Government in English. This process tends to privilege English speaking residents and poses a disadvantage to residents speaking Inuktitut as their first and perhaps only language. These individuals experience barriers to dealing with the government despite the promotion of the Inuit language and culture. Even for those individuals fluent in English, these arguably contradictory policies and practises of the NG are considered contrary to the fundamental principles of the NG, and previously the LIA. These concerns regarding the Nunatsiavut Government present real and substantial hurdles between Nunatsiavut residents and the Nunatsiavut Government. It appears that these have an influence on the capacity of Hopedale residents to be easily involved in decision making or have their concerns addressed. The role that these and related institutions can play in overcoming these hurdles will be discussed in the following chapter. The following

section summarizes some of the adaptive existing strategies that are being employed in Hopedale to deal with the vulnerabilities discussed in this chapter.

5.3 Adaptive Strategies

Individuals and households are taking up a number of autonomous strategies to deal with the range of vulnerabilities discussed in this chapter. Although many of these strategies have proven helpful in the relatively short term, the long term effectiveness of these approaches is questionable particularly in light of oncoming environmental and other change. A number of these adaptive strategies employed in Hopedale are discussed below.

5.3.1 Adapting to Changing Wildlife Availability & Accessibility

A longstanding and generally reliable adaptive strategy used to cope with reduced access to harvesting areas is to share harvested country foods. Although some strain on these sharing networks has been observed, these networks are providing a system through which individuals in the community are able to obtain high quality food sources at a minimal, if any, cost. This enhances an individual's ability to deal with changing conditions and increasing costs of travel, as they can rely on a stock of wild meat that has been harvested by someone in the community. Another strategy employed by some Hopedale residents to deal with increasing costs associated with hunting and fishing is to pool resources or informally 'rent' access to a boat through a friend or family member who owns a boat or has access to a boat. If someone does not own a boat, there is the custom of pitching in on the gas for the boat and bringing one's own food and supplies to join the boat owner to go out on the water and spend time fishing by rod, or rodding. Although this is a fairly common practice in the community, it is a strategy that improves the

community's ability to deal with increasing costs of travel. This allows people without their own boat to continue to participate in seasonal fishing activities to obtain fish for themselves and family members at a more affordable cost.

Another strategy has been to change travel and harvest timing and to make trade-offs. Hunters in particular will wait weeks later until the ice is safe enough to travel on before going out on land. This has also led to changes in harvesting strategies. Rather than travel several times to obtain wood for example, people are traveling fewer times and attempting to obtain more wood. When harvesting wood, many residents typically take the opportunity to hunt ptarmigan within the wooded forests. Since they have to reduce their trips to cut down firewood, they make the decision to focus their time on collecting, sawing and loading firewood instead of hunting. As a result people are making tradeoffs in the resources they harvest. Firewood is a priority as it provides heating to the house and is economically more desired than purchasing wood in town. The consequence however, is that country food such as ptarmigan is not harvested as much and as a result residents are bringing less ptarmigan into the community and there is less therefore to be shared amongst community members. As an example, one wood harvester states:

...with the price of gas, you gotta do it (collect wood) all in one trip, eh. And sometimes you don't get time to go hunting, just collect the wood and come out again...

-Hopedale Hunter

Some residents are choosing to purchase wood rather than harvest it themselves. Wood is the only natural resource that is available for purchase within the community from the Inuit Community Government and some local residents sell it informally to others in town. The quality of the wood for sale is generally good. However, there are two types of wood used in burning, green wood and burn wood. Green wood is wetter, poorer burning quality wood that is more readily available around Hopedale than burn wood. Burn wood is wood that has survived

through a low brush forest fire and is a drier wood, which burns cleaner with less smoke and longer (Government of Canada, 2006). According to Hopedale residents, green wood has a tendency to leave a residue along the interior of a chimney making it also a potential fire hazard. House fires are not uncommon in Hopedale, and a brief walk around the community makes this quite evident as a number of homes are boarded up due to fire or water damage. Most recently, in the month of February 2009, the well used community youth hall and radio station where weekly bingo and other social events take place was entirely destroyed in a fire. The cause of this particular fire is unknown.

Other residents, particularly elders who are physically unable to harvest their own wood and maintain a fire are choosing to convert to oil burning furnaces instead of wood. This adjustment however can be very costly and again is not the preferred method of heating a home for most residents. By making some adjustments and trade-offs in their hunting and traveling activities, Hopedale residents are still able to obtain and stockpile firewood to use it as they need (Figure 5.6). Employing adaptive strategies such as making tradeoffs and stockpiling resources demonstrates an example of the existing capacity of Hopedale residents to deal with some aspects of their vulnerability to changing accessibility to wildlife and other harvesting areas.

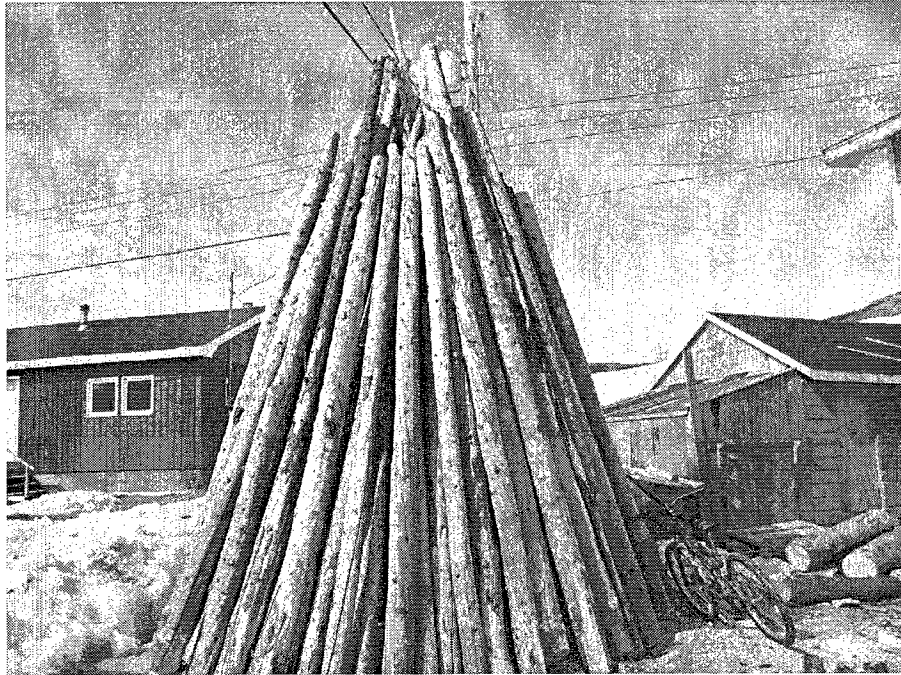


Figure 5.6 Stockpiling firewood for heating homes in Hopedale.

5.3.2 Adapting to Changing Sharing Networks

The reduction of various countryfoods in the community leads to a smaller pool of countryfoods available to be shared and as a result, residents purchase more store foods. Those individuals who do not own a boat or skidoo or have reliable access to one and also are experiencing the constraints within community sharing networks must revert to store bought foods to supplement their diets. Since the foods available at the store are of lesser quality and nutritional value compared to country foods (Table 5.2), the diet and nutrition for some residents is compromised.

Store food Item	Protein (g)	Fat (g)	Country food Item	Protein (g)	Fat (g)
Hamburger	16	28	Caribou	26	1.4
Pork	12	45	Ptarmigan	27	1.8
Lamb	16	28	Snow Goose	24	6.1
Chicken	20	13	Whitefish	24	3.9
Wieners	14	21	Trout	23	2.1

Table 5.2. Nutritional comparison between selected store foods and country foods (Adapted from Usher, 1976).

Since these valuable country foods cannot be sold within the community in stores it is nearly impossible for some families to obtain the high quality and nutrition of these foods. This was highlighted by one parent in the community:

*... no one is sharing around here, you can't get nothing from people no more...
I haven't even had any fish yet this year... -Hopedale Resident*

Although this example may not necessarily represent the perceptions of the community overall in terms of the extent to which sharing has changed in Hopedale, it suggests that there are possibly individuals or families in the community who are currently experiencing challenges to obtaining country food.

While these examples of adaptive strategies may prove to alleviate some elements of the stresses being experienced by Hopedale residents, they are not catch-all solutions nor are they advantageous for all residents. Coupled with the expected and potential changes of the future, there is concern about the capacity of individuals and households to manage these changes in the long term.

5.3.3 Adapting to Limited Employment Opportunities & Increasing Costs of Living

Limited employment opportunities exist in Hopedale. With the decline in the fisheries market regionally and limited investments in natural resource developments, there are few opportunities for employment for Hopedale residents (Brice-Bennett, 2004; DeSantis, 2008). Parents have concerns for the community's next generation ability to find work locally, particularly in light of future demographic transition (Statistics Canada, 2006). There are limited opportunities within government, and despite the creation of new positions through the Nunatsiavut Government, there are few residents qualified for the roles available due to the specific qualifications required for the roles. This is due partially to the limited completion of high school education as well as the lack of bilingualism, fluency in both English and Inuktitut which is a requirement of many NG positions (Statistics Canada, 2006). Instead, it is anticipated by parents that many youth will need to travel outside the community to the island of Newfoundland or to Goose Bay for work. The result of this transition, which according to some residents is already occurring, will be a decreased permanent population in the community.

Despite the long-term history of survival in what has been referred to as the 'inhospitable climate' of the northern coast of Labrador (Environment Canada, 2004), some government representatives from outside Nunatsiavut are sceptical about the long term sustainability of a community like Hopedale. The lack of new resource development initiatives and employment opportunities and the high costs of living have convinced some key informants that Hopedale is unsustainable and that eventually it will become like many small fishing communities of Newfoundland and one day become deserted. Given the patterns of seasonal and more permanent migration out of the community for work or education observed by Hopedale residents, and impracticalities of investing in another fish processing plant, for example, there are

some who question the value in sustaining these communities. Similar to many small fishing communities throughout the island of Newfoundland, there are concerns that in the long term these communities will dissolve due to economic and social strains and that this is a consequence of larger scale economic forces that are to be expected. Despite the relevance of these issues in Hopedale, the Nunatsiavut Government continues to invest in economic and social development initiatives. The economic potential of the longer shipping season and the tourism industry, for example, may enhance Hopedale's economic opportunity and sustainability. These developments may prove to be necessary, particularly in the face of uncertain future changing environmental conditions.

5.4 Future Vulnerabilities

Based on this analysis of current vulnerabilities and adaptive capacity, it is evident that elements of the existing adaptive capacities are insufficient. If adaptive capacity is not enhanced, it is likely that vulnerability will persist. In particular, as the influence of climate change is experienced in Hopedale, these vulnerabilities can be expected to exacerbate in the future. The following section discusses the anticipated manifestations of environmental change that will potentially influence the vulnerability of Hopedale in the future. Improvements and enhancements in adaptive capacity that account for these vulnerabilities therefore need to be addressed.

5.5 Future Climate Change

Increasing emissions and subsequent climate change, changes in sea ice, temperature and precipitation are expected to continue (IPCC, 2007). As a result of increasing temperatures, sea ice duration and length of freeze up season are expected to decrease in duration resulting in shorter winter seasons and less flexibility in winter and spring travel (ACIA, 2004; IPCC, 2007). Hopedale residents will potentially be confined to the community earlier in spring and later in winter while the bay and sea ice freeze up and break up. While travel over sea ice immediately before break up and after freeze up is currently feasible, it may not be possible in the future. This time period is the beginning of the spring hunting season and could put additional strain on these annual activities. Earlier spring season will likely contribute to changes in wildlife behaviour and migration patterns due to changes in the timing of snow fall and food availability (Chaulk & Turner, 2008; Comiso *et al.*, 2008). It is known that a change in ocean temperature along the Labrador Coast will cause fish to change their location for spawning and migration, thus the timing and location of various harvested fish species may change along the coast, including the regions around Hopedale (Stanseth, 2002). The availability of salmon or char, for example, could change significantly due to changes in sea temperature as well as fresh water break up. Similarly, changes in seasonal temperatures and the sea ice break up may influence the timing and migration patterns of migratory birds harvested annually by Hopedale residents.

Based on current trends, sea ice thickness and extent have been projected to gradually reduce across the Arctic (Strove *et al.*, 2007; IPCC, 2007). Recent observations of sea ice behaviour now suggest that predicted measurements have underestimated the speed of sea ice decline and that even the most extreme predictions have been surpassed (Comiso *et al.*, 2008). The implications of a shortened sea ice season on residents of Hopedale are clearly significant in terms of travel,

hunting and fishing activities as well as safety. Accidents involving skidoos breaking through sea ice in Nunatsiavut are not a frequent occurrence; however, the potential for accidents could increase with a longer period of unstable ice conditions and a shorter window of opportunity for traveling to important hunting and fishing locations via sea ice.

A reduction in sea ice extent is perhaps only one example of the implications that changing environmental conditions may have for Hopedale residents. As further research explores the nature of change such as increasing temperatures and changing precipitation patterns on ecosystems, the additional and likely stresses on existing vulnerabilities of Hopedale will become more apparent. Their capacity to continue to deal with these increasing changes into the future however, will have a significant influence on the degree to which residents of Hopedale can manage these various changes.

5.6 Future Adaptive Capacity

Although Hopedale as a community will continue to be exposed and sensitive to socio-political, economic and biophysical changes in future, it is also equipped with institutional structures and arrangements that can enhance capacities and improve opportunities to adapt. Some of these phenomena as discussed above, such as food sharing networks and Labrador Inuit Knowledge, have the potential to function as capacity enhancing strategies and opportunities at the local level. The following chapter will explore the role that these institutional structures and arrangements at the local, regional scale in particular, will have in determining future capacities in Hopedale.

CHAPTER SIX

GOVERNANCE & KNOWLEDGE SYSTEMS

6.1 Governance & Knowledge Systems

This chapter describes and explains the role of governance systems, institutions and knowledge systems in enhancing adaptive capacity in light of the vulnerabilities discussed in chapter five. This chapter considers the pertinent departments, actors and institutions involved in the management of primarily wildlife and natural resources as related to Hopedale's vulnerabilities. In particular, this analysis focuses on the existing capacities and constraints within and in between these institutions across and within multiple levels of governance and knowledge systems within which they inform and make decisions. Finally, this analysis explores the ways in which these constraints and capacities influence adaptive capacity currently or may shape future adaptive capacity to deal with climate change. A particular focus was initially directed towards institutions and decision makers pertaining to wildlife and other key natural resources important to Hopedale residents, however chapter five also provides evidence that institutions beyond wildlife management are pivotal to developing capacity to manage stress in the community including climate change. These additional institutions are therefore also included in the analysis of institutions and governance. It is important to note that while a comprehensive overview of a number of institutions is included within this analysis; this does not comprise an exhaustive list of the numerous interrelated institutions and stakeholders

This chapter is organized by level of governance institution, and includes formal and informal elements of institutions as well as the role of knowledge systems within each scale of governance. To begin with, this chapter will review the multi-level governance structures that pertain to the vulnerabilities exhibited in Hopedale, Nunatsiavut.

6.2 Multi-level Governance

Following the conceptual framework that has guided this research, the role of formal and informal institutions at multiple levels are explored. With reference to the vulnerabilities discussed in chapter five, the role of these institutions in enhancing the adaptive capacity of Hopedale and reducing these vulnerabilities is assessed. Considering the recognition that enhancing adaptive capacity to deal with climate change extends beyond the role of the community and the local scale, this research scales up to the regional, provincial and federal levels of governance to determine the role of these institutions in directly or indirectly enhancing capacity to manage Hopedale's vulnerabilities currently and in the future (Ostrom, 2007; Agrawal, 2008). This analysis explores the ways in which institutions and multi-level governance systems play a role in vulnerability and enhancement of adaptive capacity to climate change.

The multi-level structure of the governance system in question which is comprised of a myriad of institutions and actors is indicated in figure 6.1. The diagram illustrates that the institutions within this system of governance span multiple levels, are formal and informal in nature and include capacities and constraints with respect to adaptive capacity. As chapter five demonstrated, the underlying forces that contribute to vulnerability in Hopedale are not isolated to a particular stress, rather, they are characterized by multiple stresses that touch upon social, economic, political and environmental aspects. It follows then, that addressing the sources of Hopedale's complex vulnerabilities may necessitate adjustments or improvements on the part of one, some, or all of these institutions to varying degrees, depending upon the underlying attributes of the specific vulnerability. For example, addressing the issue of changing sharing networks due to reduced access to and availability of wildlife may solicit the involvement of not

only wildlife management institutions. This may also involve the Provincial Grenfell Labrador Health Department and the Nunatsiavut Department of Social Services and Board of Education to possibly invest in community freezers or other storage facilities, for example. These interventions may improve the ability of the community to pool excess country foods and promote sharing and the importance of country food consumption for health. It is important to note that the following discussion does not involve an evaluation of the effectiveness of existing institutions nor does it include a prescription of management approaches that need to be undertaken to address the vulnerabilities in Hopedale. Rather, the following analysis considers the overall role of the related governance and knowledge systems in potentially making adjustments to change existing governance outcomes to reduce the vulnerabilities of Hopedale and enhance the adaptive capacity of the community to deal with climate related and other changes.

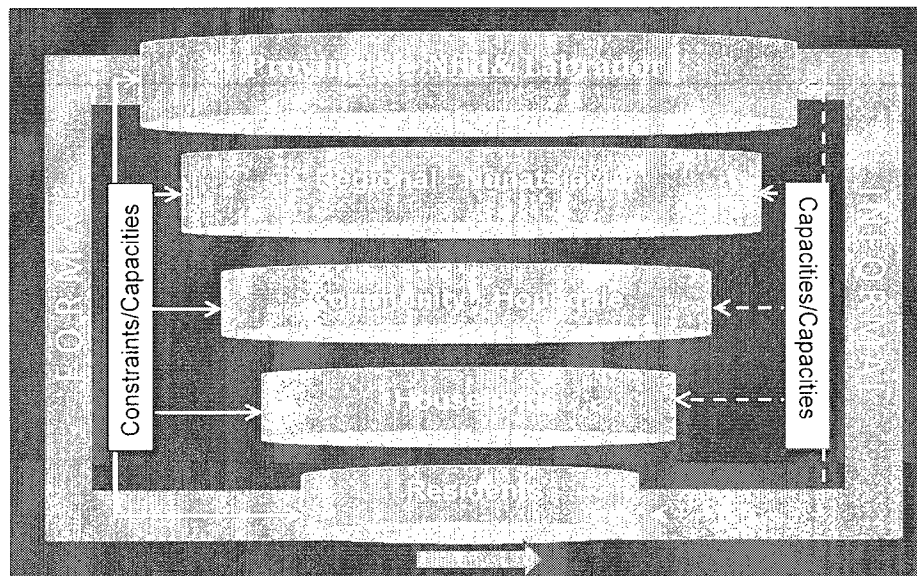


Figure 6.1 Conceptual Diagram of Hopedale's Multi-levelled Governance Structures & Institutions.

6.3 Local Governance

At the local level, there are several institutions involved in governing resources pertinent to the community, both formal and informal. As illustrated by the lower three spheres in figure 6.1., the individual, household and community are involved in governance at the local level, including formal and informal rules and norms that dictate resource use at this level. The Inuit Community Government of Hopedale plays a significant role in setting most of the formal rules and decision making mainly on behalf of the Nunatsiavut Government while the individuals and households maintain an intricate, long standing system of informal rules and norms in the community. The sharing networks in the community and taboos against wasting resources are two examples of this system. Although at the local level, both the formal and informal institutions reflect similar underlying approaches and expectations regarding decision making, it is also apparent that there also exist conflicting perspectives within and across these institutions that will need to be considered with regards to facilitating adaptation and enhancing adaptive capacity. These are discussed in the following sections.

6.4 Local Formal Institutions

The formal institutions involved in the management of wildlife and other community resources are linked to departments and actors at broader scales and operate at the local level and are based out of the community of Hopedale. The main formal institution at this scale, however, is the Inuit Community Government, which is the local representation of the Nunatsiavut Government. The Inuit Community Government plays a role in managing both community as well as regional affairs. A second actor at the local level is the Nunatsiavut Wildlife Officer who

mainly acts as the contact person for wildlife monitoring and enforcement in Hopedale and is employed by Nunatsiavut's Regional Department of Lands and Resources. There is one Wildlife Officer based out of each of the coastal communities in Nunatsiavut. It is the Inuit Community Government that contributes to the majority of decision making within Hopedale while the Wildlife Officer acts as an intermediary between the community and the Nunatsiavut Department of Land and Resources. Both of these institutions and actors however play a role in shaping the capacity of Hopedale residents to manage changes including changes associated with climate change.

Under the Nunatsiavut Government, the Inuit Community Government or ICG acts as the intermediary between the community and the Nunatsiavut Government but also serves as a decision making authority within the community. Most of the decision making authority with regards to wildlife, employment, health and social service, remains within the regional Nunatsiavut Government. The decisions made by the Inuit Community Government do influence the capacities of individuals and households of the community. More importantly, however, it is this level of government that implements many of the plans or strategies that come from other levels of governance and, therefore, the Inuit Community Government of Hopedale plays an important role in the process of facilitating adaptation initiatives or plans. The nature of the interactions between the ICG and the community are therefore important in terms of the broader process of successfully implementing adaptation plans or strategies that are rolled out at the local scale.

Although the ICG follows a similar approach to governance as the Nunatsiavut Government, in terms of integrating of Labrador Inuit Knowledge and prioritizing Labrador Inuit interests in decision making, there are patterns of interaction between the community and the

ICG that are influenced by the attributes of these two stakeholders which are contributing to constraints in the adaptive capacity in the community. This is particularly evident with regards to the extent of community involvement within decision making processes discussed in the following section.

6.4.1 Inuit Community Government

The Inuit Community Government, similar to the other Inuit communities in Nunatsiavut, is governed by the town *AngajukKâk*, also referred to as the chairperson, or mayor. In accordance with the Labrador Inuit Land Claims Agreement (LILCA), this position must be filled by an *Inuk* or Inuit person. The Inuit Community Government is the intermediary between Hopedale residents and ministries of the NG but it also functions independently regarding certain matters of land use, utilities and housing. The decision making authority of the Inuit Community Government is outlined in the LILCA. Prior to the LILCA, the Labrador Inuit Association (LIA) acted as the central governing institution while the town council managed the LIA issues at the community level. The transition from the joint LIA and provincial governance of Labrador to the Nunatsiavut Government did not lead to a significant change to the overall functioning and operation of the community government. Notable changes came, however, with the formalizing of a self-governing system based on Inuit principles and interests over the Labrador Inuit Lands.

This new decision making authority enhances the capacity of the Inuit Community Government to capture the interests of the community within their decision making process. In principle, this provides Labrador Inuit with the assurance that decisions are being made by their government based on their interests, values and priorities as Inuit people. These interests are distinct from what a provincial, non-Inuit government has decided for the region historically.

This is evident in the case of mineral exploration interests in the region which has faced significant resistance from the Nunatsiavut Government and Inuit Community Governments. The three year uranium moratorium set by the Nunatsiavut Government in 2008, stated that a reason for this decision was due to the fact that “Inuit are concerned about the negative environmental and public health effects associated with uranium mining” (Nunatsiavut Government, 2008). This particular decision is an example of the ways that the Inuit led government is ensuring the immediate as well as long term interests of Labrador Inuit in their decision making processes. At the same time, however, there are other cases of a disconnection between the other interests of Hopedale residents and the outcomes of decisions made by the Inuit Community Government.

Despite the fact that the ICG is officially an Inuit self-governing institution, it has also been criticized by the very people who voted in support of its establishment. It has been suggested that the Nunatsiavut Government approach overall is very similar to the governance of the provincial government that dominated the region for the latter part of the twentieth century. The system of governance adopted by the Nunatsiavut Government which is upheld by the ICG has been described by one Hopedale resident as a ‘white man’s’ government. A number of residents stated that the process for making decisions regarding Labrador Inuit is distant and removed from the people in the community, stating that government meetings are held in the community but that residents are often unaware of the meetings or their purpose. Similarly, residents suggest that meetings and interactions with the government at the regional level and the local level are based in the English language and that few individuals within the government are fluent in Inuktitut and English. Although this is problematic for residents who are primarily Inuktitut speaking, the broader concern is that by privileging English within the governance

processes, the Nunatsiavut Government is undermining the efforts by the Labrador Inuit Association which sought to maintain Labrador Inuit culture and language.

Another concern regarding the ICG is that the outlets for engaging community members within decision making processes are ineffective. Weekly council meetings held by the ICG are rarely attended by Hopedale residents. Interviewees stated that the public meeting is not a forum in which they are comfortable raising their concerns. As discussed earlier, it is not common for residents to use the community council meetings as a forum for voicing their concerns or objections regarding a proposed change in the community. Instead, residents tend to discuss their concerns amongst themselves within the home. Even though, as the *AngajukKâk* for Hopedale stated, there are notices placed around the community in advance of certain community meetings, residents very rarely attend. Although members of the ICG are members of the community, the lack of engagement of the rest of the community in its governance processes questions the representativeness of Labrador Inuit interests by the ICG.

This has implications for the adaptive capacity of the community of Hopedale. Without community appropriate opportunities and avenues to participate in governance processes, which take into consideration the non-confrontational attributes of the community, the ability of Hopedale residents to communicate their priorities and interests may be compromised. As stresses such as the increasing implications of climate change affect the community, in the form of increasing costs associated with traveling and harvesting, for example, residents will require an effective outlet to ensure their concerns for government intervention or assistance are heard. This example of the interactions at the local level between the community and the local government illustrates that despite a self-governing institution that is focused in principle on Inuit interests in Hopedale, there are interactions that hinder the capacities of Hopedale residents

at the local level. To ensure capacity is enhanced, the ICG may benefit from exploring alternative approaches to interacting within the community beyond existing more formal arrangements such as meetings. Alternative options, discussed later with regards to the management of the Torngat Mountains National Park, offer a hands-on, on the land interaction in which local residents are invited to spend time with park managers to informally discuss the significance of the land and determine the interests of the local residents regarding management and decisions made about the park. Adopting a similar approach by the ICG may help facilitate better interaction between the community and the local government and enhance the capacity of Hopedale residents to participate in governance processes.

6.4.2 Nunatsiavut Department of Health, Education, Social & Economic Development

Handling most of the socio-economic, and health related matters in Nunatsiavut, the Nunatsiavut Department of Health, Education, Social and Economic Development also plays an important role in shaping the adaptive capacity of Hopedale residents, particularly regarding employment, health and social well being. Formerly referred to as the Labrador Inuit Health Commission, or LIHC, this department manages all aspects of Labrador Inuit health, education and social and economic development with the exception of the overlap with the Provincial health and social services. The facilities that service these interests within Hopedale are based out of two separate buildings. One building serves as the social and cultural centre and another, the Labrador-Grenfell Community Health Clinic, is a provincial building but is serviced in partnership with the Nunatsiavut Government (Labrador-Grenfell Health, 2007). The health clinic provides basic health services in the community. Medical evacuations, which are not uncommon, transport residents out of the community to Goose Bay or St. John's for medical emergencies beyond the capacity of the clinic. This building is serviced by a small team of

nurses and a visiting physician, dentist and psychologist who each travel to the community periodically. Due to the significance of the physical and mental health issues in the community such as suicides and attempted suicides, drug and alcohol addiction, this centre within the department plays an important role in facilitating capacity of individuals and the community currently, and will also into the future (Statistics Canada, 2006; ITK, 2008).

Similarly, the Department of Social and Economic Development in Hopedale provides family services, cultural and language programs and other services. This department is crucial in terms of improving the social, cultural and economic well being of Hopedale residents. Services available through this department are designed with Labrador Inuit needs and interests in mind. One example is the Inuktitut 'language nest' program that runs out of this centre. This program allows new parents to take their children and infants to the centre for a set period of time each week to be fully immersed in the Inuktitut language. Parents attending are only allowed to speak Inuktitut and are therefore encouraged to pick up or improve on their skill with the language also. This program has been designed to help foster the language of Labrador Inuit into future generations. This facility and, in particular, the language program promoted by the Department of Social and Economic Development, helps to promote the value of the Inuktitut language and Inuit culture. As indicated, a significant resource to Hopedale residents is Labrador Inuit Knowledge which is entrenched in Labrador Inuit culture, tradition and language. Through the promotion and preservation of the Inuit language, there is an opportunity to provide the younger generations with an understanding of the language that is part of the knowledge and worldview of Labrador Inuit. By institutionalizing the transmission of the Inuktitut language, the Department of Social and Economic Development is enhancing the capacity of future generations in the community to be able to draw on the Inuit knowledge which is embedded

within the language while on the land and sea to better manage and adapt to the changing conditions.

In addition, there is a role for the Nunatsiavut Department of Health, Education, and Social & Economic Development to reduce vulnerabilities pertaining to employment, costs of living and changing sharing networks in Hopedale. Despite the nature of change in the community significantly pertaining to the environment and wildlife changes, a great deal of the capacity to deal with such changes relate to the social and economic aspects of the community. The underlying issues of scarce employment, income, health, and limited access to transportation all fall under the mandate of this institution, either directly or indirectly. To address these interrelated vulnerabilities, this department will need to play an active role enhancing the capacity of Hopedale residents. While seemingly self-evident, an increase in the number of employment opportunities which are accessible for Hopedale residents will improve the capacity of many residents to finance the costs of travel on the land and sea to hunt and fish. With consideration for the fifty percent of Hopedale residents over the age of 15 who as of 2006 had not attained a formal certificate, diploma or degree, the jobs needed in Hopedale should be developed with the educational parameters of the employable population in mind. New employment opportunities can also help to improve the capacity of Hopedale residents to cope with the increasing costs of living on the coast.

One example of such assistance is already in place in the Inuit region of Nunavik in Northern Quebec as well as in Nunavut. The Hunter Support Program (HSP) is a highly successful example of an initiative funded and facilitated by the regional Inuit government which provides the community with access to not only country foods harvested by local hunters and fishers, but also the necessary equipment and transportation to participate in the hunt and is open

to all beneficiaries of the regions (Kishigami, 2000; Ford *et al.*, 2007). This type of program could prove to reduce a number of vulnerabilities related to the costs of travel (access to boat, skidoo, and fuel), strains on sharing food, and changes in the accessibility of wildlife and fish. Although a program of this nature would be beneficial to Hopedale residents, and likely the Nunatsiavut region overall, it is not known whether the institutional structure and organization is able to facilitate this at this time, given the Nunatsiavut Government's period of transition currently still in progress. However, due to the prevalence of a similar type of program elsewhere in the Inuit regions in Canada, it is possible that a similar program could be beneficial and effective in Nunatsiavut as well.

6.4.3 Nunatsiavut Department of Lands and Resources

The Nunatsiavut Department of Lands and Resources and the Department of Renewable Resources, both managed through the Department of Lands and Resources, manage most aspects of wildlife and resources of the Nunatsiavut region. These two Departments are similar in their approach to management in that they both tend to prioritize Labrador Inuit Interests in their decision making. This is evident by the way that interviewees spoke of their responsibility and their ability to uphold the Land Claim Agreement, which the Nunatsiavut people had worked so long to achieve. It is also evident that these departments are still very new and are still rolling out management plans and initiatives, including initiatives regarding managing climate change. The newness of these departments was made clear by one interviewee;

'the whole idea of government is new, our partnerships between governments is still new...the idea of co-management is also new for everyone' *–NG Representative*

Similarly, it was clear that the Nunatsiavut Department of Lands and Resources as well as the Department of Renewable Resources had recognized climate change as an important issue for the region:

It's (climate change) on everyone else's agenda right now, not just the NG

-NG Representative

To some extent, climate change has become an agenda item of the NG is due to the influence of external funding opportunities. The International Polar Year (IPY) for example, has helped raise the profile of climate change in the region by bringing research initiatives to Nunatsiavut. This has allowed the NG Departments of Lands and Resources and Renewable Resources to benefit from the research. It is not clear whether climate change would be an agenda item or be a priority at this time during the NG's transition, if not for the influence of funded research projects. The prevalence of these research initiatives however, is increasing awareness of the topic of climate change amongst Nunatsiavut residents as well as within the government itself.

Currently, the goal of these departments is to build a baseline data set regarding wildlife, climate and ecosystem change that would create a basis for assessing the effects of climate change in the region. It was stated by one interviewee that their aim is to acquire as much information as possible so as to better understand what the changes are and how to manage them in the future. As one interviewee explained, part of the rationale for building up a storage of information was based partially on the fundamental principles of the LIA, which sought as much information as possible in order to be able to make informed and empowered decisions. Similar to the decision about uranium moratorium, these two management departments are not rushing to implement management plans to address climate change. Rather, they are steadily working

towards building a database of information for the future. The representatives of these departments made it clear that climate change is taken quite seriously due to the potential implications it could have on the livelihoods that characterize the Nunatsiavut region, being significantly dependent upon the natural resources and environment. The fact the NG representatives are themselves residents of the Nunatsiavut region appears to significantly influence their perspective and approach to climate change. This dynamic will potentially improve the capacity of residents of Hopedale, for example, as their livelihoods are well understood and the needs and interests of the communities of Nunatsiavut are more likely to be considered and integrated within decisions made by these two key resource management departments. This was evident when speaking with representatives of the Nunatsiavut Department of Renewable Resources and Land and Resources who stated that decisions would not be made until they were satisfied that they had acquired as much information and data as possible that could allow them to make well informed decisions that were certainly in the best interests of Labrador Inuit.

6.4.4 Nunatsiavut Wildlife Officers

Also managed through the Department of Lands and Resources are Wildlife Officers. For each community along the coast, there is one Wildlife Officer. These Officers work mainly independently from the community but keep in contact with their managers located in North West River or Goose Bay, and also travel to Goose Bay and Northwest River for training and recertification. Their responsibilities include but are not exclusive to monitoring, enforcement, distributing tags for salmon quotas and they also act as the contact person for wildlife research projects taking place in the vicinity of the community. Working independently, the Wildlife Officer's capacity is frequently compromised as they are unable to cover all activities on the land

at all times, largely due to the vast territory that the wildlife officer is required to manage. These officers also tend to spend time away from the community periodically for training and communications with the department in North West River or Goose Bay as the management staff rarely travel to the coastal communities of Nunatsiavut themselves. Currently, the capacity of the wildlife officer to satisfy all aspects of his position particularly in the area of monitoring and enforcement is questionable for a number of reasons.

In terms of monitoring wildlife behaviour, health and abundance there is only so much capacity that the officer has in a day to devote to these activities. For the most part, this role is mainly preoccupied with distributing tags, traveling on the land and water to monitor activities of hunters and fishers and to ensure that those who require licences have obtained them. This means not only ensuring that quotas are being respected, fishing nets are numbered and set only during the allotted time frame, but also ensuring that residents who are out on the land are leaving minimal impact in areas in which they are traveling. Any waste or refuse left by hunters or fishers ends up as the responsibility of the Wildlife Officer to deal with and ultimately these activities remove him from dealing with other issues such as overharvesting. In addition, as the Nunatsiavut Department of Lands and Resources unveils new projects and initiatives through the unfolding of the transitional government, there are new responsibilities added such as providing information and monitoring activities related to wildlife or fisheries research projects through NG, universities and other institutions. As a result, this position is frequently overwhelmed with new responsibilities and is unable to have much influence on what people do on the land.

One of the main sources of frustration for the Wildlife Officers is their lack of capacity to effectively enforce quotas or ensure subsistence harvest levels are kept within reason. As part of their responsibilities, Wildlife Officers are required to monitor the nearby lands and bays to

ensure proper harvesting activities and also to ensure the safety of local residents on the land and sea. In the rare instances that they are confronted with noncompliant hunters or fishers, there is ultimately little they can do. Unlike the Conservation Officers of the Provincial Government, the Wildlife Officers are not armed. Given the historic struggle over entitlement to harvest from the sea and land on the coast and the resident's deserved sense of right to harvest what they deem necessary, it is a wildlife officer to request an armed hunter or fisher to stop when they themselves are without any means of protection or backup support. Based on observations by one of these Wildlife Officers, access to a firearm could enhance their effectiveness in enforcing proper harvesting activities, even if it is an unusual occurrence. Further complicating these interactions is the dynamic of a small community and the reality of confronting these same hunters outside the work environment. It is not in the best interest of the Wildlife Officer to threaten someone out on the land when they are his neighbour or even his relative. This places the officer charged with the task of monitoring over harvesting activities or polluting, in a rather difficult position. The capacity of this officer to ensure proper harvesting practises and minimize the instances of overharvesting is compromised by these issues.

Lastly, Wildlife Officers are also charged with the task of monitoring the nearby land for potential illegal prospectors. The vastness of the area surrounding the community of Hopedale alone is immense. Similar to enforcing salmon or duck harvest activities all throughout the region, monitoring the land for prospecting activities is nearly impossible. Even in the event of spotting a prospector on the land, the officer is limited in their capacity to reprimand individuals who have the means to exit the location as easily as they accessed the area. While these types of extreme scenarios are not to be perceived as the norm for this position, they are additional stresses that compromise the capacity of the wildlife officer to implement management strategies

such as quotas that come from outside the community level. This has direct implications for facilitating adaptation management plans that account for changes in species abundance or health due to a changing climate. The success of broad scale, regional management and conservation plans, developed by both provincial and Nunatsiavut departments, weigh heavily on the local level implementation. There is a valuable role therefore, for the Wildlife Officers in the process of implementing adaptation initiatives.

6.4.5 Provincial Conservation Officers

Similarly, the Provincial Government employs a Conservation Officer who services the coastal communities of Labrador. This conservation officer is hired by the Provincial Department of Natural Resources. Their role is mainly safety oriented; they serve as an intermediary between wildlife and the communities along the coast. There is one conservation officer who covers all the communities along the coast and he is mainly based out of Hopedale, but travels often to ensure a presence along the entire coast up to just past Nain. This position serves as the main monitor of wildlife activity along the coast, in terms of their proximity and threat to communities. If a polar bear for example encroaches on a community, or a fox is found in a community, the conservation officer is contacted and they are responsible for dealing with the situation. This officer is licensed to carry firearms and obtain recertification each year on tranquilizer use, first aid, etc. This officer is less involved with monitoring harvest levels, or species health, and primarily deals with the safety of the communities along the coast.

Unlike the Wildlife Officer of the region, the Conservation Officer did not raise concern regarding resource related conflicts with locals in the area. One possible explanation for this

difference in observation between the two Officers is the extent and frequency to which they interact with Hopedale residents. Since duties of the Conservation Officer require that he is constantly traveling over a vast region, from south of Hopedale to the northern part of the coast beyond Nain, the Conservation Officer does not interact with the communities to a large extent. A second reason for the distinction between the Wildlife Officer and the Conservation Officer's relationship with the community can also be attributed to the fact that one is armed and the other is not. The Conservation Officer is authorized and is licensed to carry a firearm on a daily basis. According to the Wildlife Officer as well as interviewees from the community, this significantly influences the nature of the interactions between the Officers and the community. The security of being armed offered the Officers an apparent necessary form of protection and authority with regards to wildlife protection, monitoring and local harvesting practises. This dynamic is important to note in terms of implementing harvest enforcement measures in Hopedale, for example.

In terms of this position in the broader scheme of reducing vulnerability in the community, the Conservation Officer does not play a significant role. The dynamics involved with this particular position of governance however does offer insight into the importance of being armed while along the coast, particularly when dealing with sensitive issues related to harvesting. The first hand observations and knowledge of wildlife changes at local and regional scales, for example, are also valuable in informing decision making at broader scales. Through their firsthand experience with monitoring wildlife activities in the area, this officer offers a great deal of insight that can be useful for making informed decisions about wildlife management, for example. Through the involvement of this officer in the decision making process, there is an opportunity to synergize his Labrador Inuit Knowledge within the governance process of the

Provincial Department of Natural Resources. For example, it has been noted by the Conservation Officer that there have been an increase in polar bear sightings along the southern part of the Labrador Coast. His observations may be influential for Hopedale residents, particularly those who partake in the polar bear hunt. Polar bear quotas are set by the joint management plan between the Provincial Wildlife Division, Department of Environment and Conservation, Government of Newfoundland and Labrador and the Department of Lands and Natural Resources of the Nunatsiavut Government. Currently, the region is entitled to harvest a total of six polar bears. These are divided between the five coastal communities entitling most communities to harvest only one polar bear and Nain residents are able to harvest two bears given that the community has a greater population. In any of the communities, once a person has harvested one, they can no longer harvest another bear for five years after. If the numbers of polar bears have increased around the coast, as observed by residents of Nunatsiavut (Brazil & Goudie, 2006), there may be opportunity for the harvest levels to be increased from their current levels. This information is an example of the ways in which this Officer could improve the capacity of the community to adapt to changes

6.5 Role of Labrador Inuit Knowledge in Local Level Governance

At the local level, Labrador Inuit Knowledge is integral to the priority setting and decision making processes. Within the Nunatsiavut Government, it is the knowledge that the Nunatsiavut Government draws on as their knowledge as Labrador Inuit. Labrador Inuit Knowledge is solicited from Nunatsiavut residents through ad hoc studies performed by researchers, particularly from experienced hunters and elders when making decisions regarding wildlife management. Labrador Inuit Knowledge is also theoretically integrated into all

ministries and this influences their approach to making decisions as well as the decisions that they ultimately make.

Announcements for town council meetings are posted weekly at public areas such as the local store, the post office, the town hall and the hotel lobby as well as broadcast on the community radio station. The meetings are held at the town hall and are usually attended by the town council board members and the community mayor. The town council are able to make final decisions regarding the community matters over which the ICG has jurisdiction. One example of this is the fees for water usage services. One example of these According to residents in Hopedale, the costs of water services recently doubled without consultation of the community. Significant concern was voiced about this during interviews as it highlighted a degree of frustration with local residents with the decision making authority of the town council. It was suggested during interviews, that if residents had been contacted and involved in this decision than maybe it would have been received better by the community, however, they were unaware of the increase until they received their bills in the mail. This event illustrates that at the community level, there are some differences in what is perceived as acceptable processes for making and implementing decisions. The main concern voiced by residents during interviews was not simply that the cost of the services increased, but more frustrating was that they were not consulted or considered in the decision making process and were left feeling less empowered in the process.

From the perspective of the town council, there are concerns on their end also. As with any governing body, it is a constant struggle to meet the interests and needs of all residents particularly with limited resources and a newly instituted form of governance. However, although this expected period of transition was communicated to the Land Claims Agreement

beneficiaries, there are perhaps unrealistic expectations amongst community members that the town council cannot necessarily meet. Further, there are a number of demands of the community that are discussed amongst residents but never raised during town council meetings nor brought to the attention of those who may be able to take action on the issue. Attendance at the town council meetings for example, is quite low, and most often only town council members are present. It is understood by the town council that the community has ample opportunity to vote against a decision or raise their concerns during town council meetings. For broad changes that will affect the community as a whole, according to the *AngajukKâk*, it is customary for the town council to deliver memos to the mail boxes of each household and ask for any objections. A member of the Inuit Community Government commented on one event in which this was done and the lack of response by the community led to a conflict. This example involved the decision to clear the roads of snow during the late winter season to allow easier transportation for the schools and to allow people to drive their vehicles during the winter season. A notice was sent in the mailboxes of each household to respond if there were any objections. When none were presented to the town council, the lack of response was interpreted as an approval by the community and the ploughing proceeded. When this happened, there was a dramatic response by members of the community who then made themselves heard by the community and let the town council know that they did not support this activity as it was problematic for their snow machines due to the need for a bed of snow cover on the land when traveling around the community in winter. The town council responded by halting the ploughing. This scenario from the perspective of the town council is that they had actively solicited the community's feedback and it was the community's role to respond if there were objections. Considering the community's response in this particular example, there appears to be a disconnect between the

approach employed by the ICG and what is received by the community. Lack of effective communication between the community and the ICG will impede the community's capacity to link their concerns up to broader levels of governance such as the Nunatsiavut Government. In terms of adaptation and enhancing capacity, these linkages are needed to allow the community to communicate their needs and interests to the institutions and forms of governance who will play a significant role in shaping the adaptive capacity of the community. Although opportunities to engage the community within governance processes do exist in Hopedale, their effectiveness in the context of the community of Hopedale requires adjustments. Some examples highlighted by community members include individual consulting with community members whereby the ICG or its representatives directly contact individuals in the community to involve them in the process of decision making.

6.6 Local Level Informal Institutions

At the local scale amongst individuals and households in the community there exist well developed and long standing informal systems of norms, expectations and practises that shape the nature of Hopedale residents' interaction with the land and sea. Although there are rare instances of individuals neglecting these values, the few instances of overharvesting or wasting resources are well known and openly opposed by community members. These institutions both facilitate and constrain individuals' adaptive capacity and thus provide useful insights into potential adaptation strategies at the local level. Following is a summary of this system and the underlying principles that shape it, including the principles of sustainability as well as the overarching influence of Labrador Inuit Knowledge.

Residents of Hopedale live by a complex and long standing set of rules and expectations regarding harvesting and use of natural resources. These 'rules of use' are tied to a common understanding regarding land and resources that is not easily defined. Many of these rules are founded on traditional beliefs and principles that can be traced back centuries to early Inuit hunters and gatherers of Labrador (Brice-Bennett, 1977). These beliefs are particularly developed amongst hunters and gatherers who are most frequently in direct contact with the land, sea and have received a great deal of knowledge from the previous generations' hunter and gatherers.

The resources harvested along the Labrador Sea are shared not only between residents of the community, but also with neighbouring communities of Nain, Makkovik, and even with some residents of Lake Melville and Goose Bay. An informal system of boundaries exists between the communities in terms of the bays and inlets that each community uses. By self-regulating the harvesting activities in certain areas such as the bays for example, residents of Nunatsiavut are reducing their impact on the land and resources. If, instead, all Nunatsiavut residents chose to harvest in one location, the impact of the traffic and extraction of resources may compromise the health of any species or ecosystems in that area. The underlying principles that guide this system of management involve sustainability, subsistence and conservation. Though the region offers an abundance of marine and land species, fresh water and sparse forests, local residents of Hopedale overwhelmingly perceive these resources with respect. Interviewees described how they only obtain and consume the resources that are needed. One illustration of this phenomenon was in the late 1990's in Hopedale when the caribou herd had literally travelled into the community and throughout the nearby islands. They were so abundant around the community, a local resident described how the harbour was "...dotted just like

pepper...” (Hopedale Resident, 2008). Despite this abundance, the harvesting of caribou was pursued on needs based only. As one was needed by a household they would then kill what was needed, leaving the herd to roam and co-exist with residents in the Hopedale area. This particular event provides a snapshot of the existing norms and behaviours of Hopedale residents with regards to wildlife and resource harvesting.

Another illustration of this well established institution of informal rules is in regards to wasted country foods. When asked about the availability and abundance of resources nearby Hopedale, for example, several interviewees’ spoke about a recent discovery of countryfoods that were found in the local dump. One resident had come across some geese and arctic char that were apparently cleaned out of a local resident’s freezer and left in the town dump. This particular incident was brought up on several occasions during interviews. Residents appeared to find this type of behaviour or action of wasting resources to be rather upsetting and disappointing. The abundance of natural resources in and around Hopedale, residents suggested, is the case due to generations of proper usage (i.e. minimal waste, killing only what is needed, sharing excess within the community, harvesting seasonally appropriate resources). These negative reactions towards wasting resources are a reflection of the taboos and social exclusion that maintain the institutions and informal rules-of-use with regards to harvesting in Hopedale. As one respondent indicated, there are additional concerns with regards to wastage of resources:

I’m not happy with the way they’re throwing away their food and that in the dump when there is people out here starving. They should give it to people who needs it. There’s a lot of single mothers here who needs food to feed their children.... -Hopedale Hunter

Residents also voiced concerns regarding increasing instances of over-harvesting. While there are only restrictions on the number of salmon that each resident can harvest which is set in place by the Newfoundland and Labrador Department of Fisheries and Aquaculture, residents of

Hopedale, and of Nunatsiavut follow a subsistence level of harvesting, only harvesting what can be immediately consumed, shared or frozen. It is apparent, however, that there are some rare incidents of what some would describe as excessive harvesting of resources. It was quite apparent that this type of activity is largely frowned upon, but current subsistence laws do not dictate any particular level or volume of harvested resources. Rather, Inuit are entitled to harvest their traditional resources for consumption and household needs. Although these rules of use have provided Hopedale residents with the freedom to obtain what is needed, some residents have concerns about the sustainability of these guidelines due to the occurrences of over-harvesting in the community. This however, is juxtaposed with the former system whereby residents were made to feel like criminals for harvesting deer (caribou) or other resources due to very restrictive harvesting levels imposed by the provincial government. Unfavourable views on wasting in the community illustrate the disincentives for unsustainable resource use in Hopedale. With regards to adaptation, such a system of rules and behaviours can be regarded as tools for the community to build on in future to ensure sustainability of resources and continued availability of the valuable species for consumption.

On a similar note, it was also found that some residents are not accustomed to formal ‘rules-in-use’ regarding fishing and hunting licensing in Nunatsiavut. Inuit of Labrador traditionally hunted and fished what was needed without obtaining approval from an institution or person to do so. As one Hopedale elder described,

everything is almost the same, [when harvesting], except now you have to get what they call ‘permission’.
-Hopedale Elder

There are residents of Hopedale who have hunted and fished for generations and feel they do not require this permission to do what they need to in order to obtain what is needed.

They are confident in their knowledge of the land, sea and its resources that they know how to take resources sustainably. This was revealed by one resident discussing migratory bird licensing:

There are a lot of people in this community who've never had a migratory bird license, or a partridge license, or a caribou license and they could be forty years old, they could be sixty years old. And guess what, they're not going to get one they'll tell ya, 'why should I? I never had one, Dad never had one, grandpa never had one, great grandpa never had one, I'm not going to get one'
-Hopedale Hunter

The formal system of licensing and quotas for fish such as salmon and migratory birds is a relatively new concept for some residents, particularly for elders who grew up in a system whereby rules of use were guided by the traditions and practices passed down through generations. This sentiment is echoed by an elder resident reflecting on the differences between fishing in the past compared to now.

It's about the same, only they got have license now to hunt fish and ducks and that animals, you got to have a licence for that now... and even the number on their boats offshore, the fishermen, they need to have numbers on their boats.
-Hopedale Elder

This perception, however, is not unique to Hopedale elders. Whether or not rules are in place, hunters and fishers in particular express an acute understanding of the land, sea and Labrador wildlife that dictates their individual decisions when hunting and fishing. This is reflected by a middle aged active fisher and hunter.

when the boys are off and come back with a box full of char, it's more char than I could eat in 12 months, but after being on land for half an hour, he didn't have any. Cause it was the first boat out, everybody wants some fresh fish and I know Sat evening, Sunday morning he got back, Sunday night we had fresh char for supper. And I'd say everyone on that street did. Only because one of the boys went out and got a box of char. So, would that be wasteful- I don't think so.
-Hopedale Hunter

The influence of these underlying and well established beliefs and practises within the community of Hopedale should not be underestimated. Though these practices or their interpretation may not be entirely homogenous across the community, they collectively function as a unique set of rules that are specific to values and concerns of the local level. These rules and principles also serve to provide capacity for the community, as discussed. With regards to the vulnerabilities identified in the community, promoting this local informal system of management may help to improve both sharing networks within the community as well as access to key resources in the community. It does this by promoting sustainable use of resources, sharing of any excess of resources and reducing the impact of hunters on the land. Promoting the value of these activities for enhancing the current capacity in the community can help to reduce vulnerability to future climate change.

6.7 Regional Governance

At the regional scale, a number of horizontally and vertically interrelated institutions are involved in governing resources important to Hopedale residents. The key institutions and departments that have been identified are described below. This selection however, is not exhaustive. A wide range of additional organizations, policies and governance arrangements are also indirectly involved in managing resources important to Hopedale residents. However, the institutions discussed in the following section were selected due to their degree of involvement and influence in the governance of wildlife, fisheries and other important resources to the region as well as how accessible their documents or representatives were to the researcher.

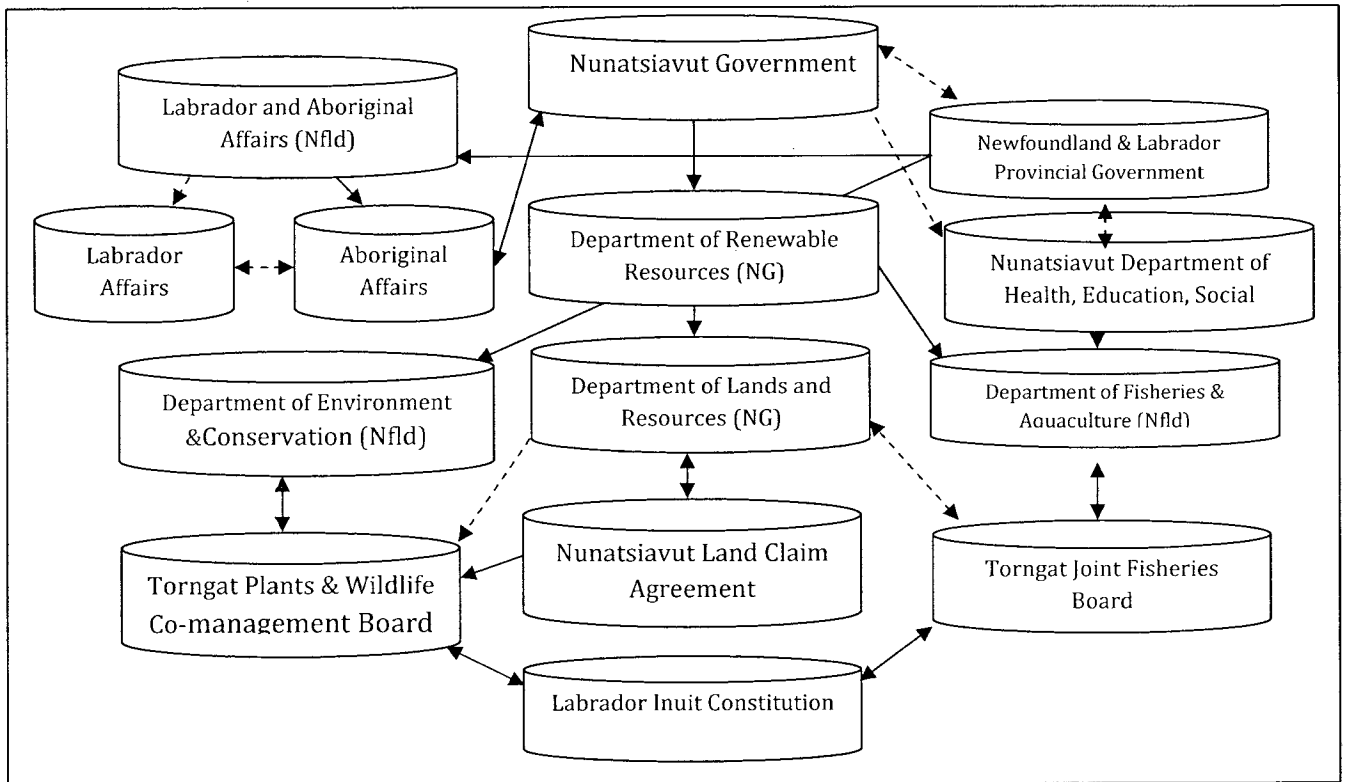


Figure 6.2 A detailed diagram of governance structures pertaining to Hopedale's resources.

The structure of governance at the regional scale involves the Nunatsiavut Government, the two Torngat Management Boards, the Newfoundland and Labrador Department of Environment and Conservation, the Department of Labrador and Aboriginal Affairs, the Nunatsiavut Land Claims Agreement and the Labrador Inuit Constitution. The key areas of responsibility within this governance system reflected in figure 6.2. are discussed below.

6.7.1 Nunatsiavut Government



As described in chapter two, the Nunatsiavut Government or NG is the recently founded self-government of the Labrador Inuit situated on the northern coast of Labrador. Since its inception in 2005, the NG has been in transition from a previously provincially governed part of the province of Newfoundland and Labrador to an Inuit self-governed region, separate from the province. The NG now operates government-to-government with the provincial government in most areas and has also established a number of Ministries, Departments already mentioned in addition to Inuit Laws and policies. Inuit laws and policies include regulations that have been established within Nunatsiavut by the Nunatsiavut Government that are legally enforceable. A key attribute of the Nunatsiavut Government's approach to governance is making decisions that are in the best interests of Labrador Inuit of the region, recognizing a unique heritage, way of life and values that are specific to Labrador Inuit, as stipulated in the Land Claim Agreement as well as the Labrador Inuit Constitution (2005). Further, another distinct result of the Land Claim Agreement was the establishment of Labrador Inuit Lands. These two features of the Land Claim Agreement have a significant influence on the nature of the governance of the Nunatsiavut Government.

Through the establishment of an Inuit government the Inuit are working towards securing their future as a distinct and unique culture with unique interests that were not being met through the former governance arrangement. As indicated prior, the Nunatsiavut Government developed out of the former Labrador Inuit Association often referred to as the LIA. While the underlying interests and principles of the Nunatsiavut Government are similar to those of the LIA, some Hopedale residents have suggested that the changeover from the LIA to the NG has not occurred as expected. The two main areas of concern voiced were the changes in the governance

approach, meaning the structure and formalities as well as the relationship of the elected representatives and the institution with the rest of the population in the region. As previously stated with regards to the Inuit Community Government, Hopedale residents have concerns regarding the legitimacy of Inuit representation in decision making processes of the Nunatsiavut Government as well as the type of formal interactions between the Government and the communities, including Hopedale, that have been established by the NG.

One of the major changes that took place with the implementation of the land claims agreement was through the establishment of Labrador Inuit Lands, also referred to as LIL. This provided the Nunatsiavut Government with ownership over these lands and subsequently excluded the provincial government from various aspects of land use and rights over the lands outlined in the agreement. Within the LIL the Nunatsiavut Government is able to make decisions regarding the use of the land and resources and this includes how they do not want the land to be used. This was evident through the three year moratorium that was placed on a uranium development in April of 2008 by the Nunatsiavut Government. This decision was a reflection of the new government's interests in land and resource health and preservation. In the past, and in some cases currently, Labrador lands and resources including wildlife has been explored and researched without the knowledge of the LIA or now the NG. The implications of these actions on the land in the past have led to a desire amongst the Nunatsiavut Government to protect LIL, particularly in instances where there is insufficient evidence that such exploration or investment will have a long term benefit to the people of Nunatsiavut and minimal impact to the land and resources.

The Land Claims Agreement requires that Labrador Inuit Knowledge is included in the decisions made by NG, particularly regarding wildlife and natural resource management. It is

important to note, however, that although the Nunatsiavut Government holds primary authority over the areas outlined by the Land Claims Agreement in figure 3.1, their authority is also limited in some respects. Section 11, chapter 17 of the Land Claims Agreement indicates that where a conflict arises between an Inuit Law and a Provincial or Federal Law, in response to protecting the environment specifically, the Province or Federal law would prevail (LILCA, Chapter 17, 2005). While the Land Claims Agreement has assigned the Nunatsiavut Government with a high level of autonomy, it will also continue to interact and negotiate with the federal and provincial governments on occasion. Addressing the concerns related to climate change, for example, is one area where intergovernmental management will need to take place amongst these bodies. How Labrador Inuit interests will be protected within these processes is not clear. The nature of these intergovernmental interactions, and the ambiguities associated with meeting Inuit interests will become important and require further clarity particularly in designing and facilitating adaptation initiatives to deal with climate change.

6.7.2 Torngat Management Boards

Through the Land Claim Agreement, two separate resource management boards were established. One is a co-managed board called the Torngat Wildlife and Plants Co-Management Board. This board includes three members appointed by the Nunatsiavut Government, two members appointed by the federal minister, and one member appointed by the province of Newfoundland and Labrador. The chairperson is nominated by board members and is appointed by the federal Minister. The second board established through the Land Claims Agreement is the Torngat Joint Fisheries Board. This board is different in that it is an advisory board to the federal and provincial ministers of fisheries. It is the primary body making recommendations to the Minister about the conservation of fish and the management of fisheries in the Labrador Inuit

Settlement Area, other than the Inuit domestic fishery and the Inuit domestic harvest level. These two boards function differently as one is a co-management board with decision making authority, while the other serves as an advisory board to the federal and provincial level decision making institutions. Both boards are directed under the Torngat Secretariat which operates out of Goose Bay.

These boards were established to monitor and ensure the sustainability of the natural resources within Nunatsiavut either for subsistence needs or commercial production, in the case of the Joint Fisheries Board. Thus far both boards have been working primarily on filling all board member positions and beginning the process of establishing the boards' standard operating procedures as well as board logistics such as meeting frequency, locations, etc. A main function of the boards is to solicit Labrador Inuit Knowledge to help inform decisions being made regarding various resources. As part of the Land Claims Agreement and the management boards, the process for this was intended to be communicated directly in each community to inform those interested in how they can forward their own knowledge or observations to the boards. However, due to the challenges with filling board positions and other delays associated with establishing an entirely new board this process has yet to take place as of June of 2008.

Though the intent for the boards to act as a formal institution and funnel for soliciting Labrador Inuit Knowledge is clear, the logistical and resource requirements involved in this process are potentially restricting. With the expected board meeting location to be based mainly out of Goose Bay and not on the coast, access to public meetings involving the board will be limited to those who have the means to travel to Goose Bay and those living within the town of Goose Bay. At the time of this research, the mechanisms for Labrador Inuit involvement in the decision making and recommendations of these boards were not clear to Hopedale residents

interviewed. For example, during discussion regarding resource management in the community-based interviews, only the Wildlife and Conservation officers were mentioned. Opportunities for the community to participate or contribute input towards the management boards were not familiar to most residents and discussions about managing resources tended to revert back to the Officers. Although the potential for integrating Labrador Inuit Knowledge into resource management governance through these boards is evident, the logistics for this process have yet to be finalized at the time of this research. Currently the board members are working towards filling all board positions, establishing the standard operating procedures and beginning to roll out the procedures of the boards. The particular focus on wildlife management and monitoring of the Plants and Wildlife Board in particular creates an opportunity for the concerns and vulnerabilities pertaining to wildlife access and availability to be brought up and potentially addressed within this forum. Increased accessibility to and communications from the board, however, are likely necessary if Labrador Inuit along the coast are to be engaged and involved with this institution. In doing so, vulnerabilities such as changing governance systems and changes in the accessibility and availability of resources may be addressed.

6.7.3 Newfoundland & Labrador Department of Environment and Conservation

Due to the migratory nature of much of Labrador's wildlife, the management of some of the key resources to Hopedale spans multiple levels and institutions including the Provincial Government of Newfoundland and Labrador. At the provincial level, the Newfoundland and Labrador Department of Environment and Conservation is the primary department responsible for wildlife management and conservation. The Wildlife Division, more specifically, deals with aspects of wildlife management important to Hopedale residents such as caribou monitoring, studies and management. The Wildlife Division, for example, recently completed a caribou

health study throughout Newfoundland and Labrador which involved communities from across both the Labrador and island regions of the province. The Wildlife Division, due to their role in wildlife conservation across Newfoundland and Labrador is an institution at the provincial level that interacts with the Nunatsiavut Government, mainly through the Torngat Plants and Wildlife Co-Management Board but also through the Department of Renewable Resources and the Department of Lands and Resources. The Wildlife Division focuses mainly on conservation and is actively involved in the monitoring of caribou, black bear, fox, Arctic hare and a number of other species.

In terms of changing conditions and future implications of climate change on wildlife and the regional ecosystems, their approach is similar to that of the Nunatsiavut Governments' Department of Lands and Resources. There is an understanding that the reality of a changing climate will likely influence the behaviour, migration and potentially the health of some species, however, there is not an immediate cause for concern. Both departments have confidence that they have a strong understanding of the status of various species and that through the appropriate periodical studies and monitoring programs, they will make the necessary decisions regarding management at that time. There is also an appreciation and expectation regarding the inherent adaptability of most species and ecosystems of the region, as reflected in this quote:

It (Labrador) has always been changing, and so have all the species in it. They (wildlife) will make adjustments as they have in the past, and we are monitoring them as well. We will make decisions (about wildlife) as we need to...

-Provincial Government Representative

Due to an understanding of and familiarity with changes that have occurred throughout the region in the past and the acknowledgement that species have adjusted accordingly, there does not appear to be an immediate concern regarding changes in conditions or behaviours of

various species. Although there does not appear to be an immediate concern to address potential implications of a changing climate with regards to wildlife management, there are signs that suggest potential constraints between the provincial level approach and the local level priorities.

The provincial level is primarily concerned with the health of species. Labrador Inuit are also concerned about the health of the species, but for the purposes of participating in traditional harvesting activities and satisfying dietary needs due to their traditional reliance on country foods. As species become stressed due a changing climate, the implications of those changes are not perceived the same by these two groups of people. Labrador Inuit of Hopedale will require information about changing migration patterns of caribou for example in order to determine whether they can access them in a given year or not. In the event that caribou become inaccessible to Hopedale residents, that will have a considerable impact on their livelihoods, well being and food sources. Hopedale residents could benefit from the information and knowledge acquired by the Wildlife Department regarding the key species relied upon for subsistence purposes, however, this information, even if preliminary research, is currently not made directly available to those who might be the most significantly impacted by the changes of these species.

6.8 Regional Level Informal Institutions

Underlying the various governance approaches across the regional scale are subtle but influential informal institutions that shape the values, priorities and formalities of decision making at this scale. In the context of the Arctic where there exist different approaches to governance including Inuit and western governance, it is important to consider where and how these differences are manifested (White, 2005; Wenzel, 2004; Dowsley, 2008). The influence that these institutions have in determining the process of decision making or what decisions are

made and also how it is implemented is important for the broader context of undertaking adaptation initiatives. The two most influential approaches relevant to this research in Hopedale include a western science based approach and an Inuit specific approach to governance. These are discussed in the following section.

6.8.1 Western Science-Based and Inuit Governance

As suggested by White (2006), governance is about more than departments and decision making. This is true of the processes at work across the various scales of management within and beyond Hopedale. There are subtle but significant differences in how these institutions, indicated in figure 6.2, approach decisions, what they value and consider when making decisions. These cultural and political differences are interpreted here as the differences between a ‘western science-based’ approach and what has been referred to as an Inuit specific approach. The underlying differences that comprise these perspectives are important to understand particularly in the case of adaptation in an Arctic community such as Hopedale.

The governance processes at work within each scale from the local to national are characterized by a set of underlying value, priorities and interests. The provincial level is characterized by a western bureaucratic approach to governance while the Nunatsiavut Government and its related departments and management boards are characterized by another. As one provincial level representative states;

...we are used to one set of processes...but when working with them (Labrador Inuit), we know we are dealing with another...
-Provincial government representative

This dynamic is perhaps most evident within the Torngat Management Boards. The representatives on the board come from three different governing institutions and bring with

them to the board a set of expectations and values regarding managing wildlife. While parties on the board share common goals such as sustainability and wildlife management, there are differences amongst the governance systems which they represent. Both a Western, science based knowledge system as well as an Inuit specific knowledge system are represented within the board. This does not however, translate to the adoption and implementation of elements from both of these knowledge systems in their decision making processes. On the contrary, is evident that decision makers, particularly those who have experienced firsthand the different knowledge system approaches, value both systems. An example of this includes provincial decisions makers who have traveled to the coast and spent time on the land and with local residents. Also, residents of the coast who have served the Labrador Inuit Association and have been involved in the negotiation process with the province and federal government express an understanding and appreciation for the obligations and priorities of these governance systems and knowledge systems.

An example of a formal institution which is bridging potential gaps in these knowledge systems is the Torngat National Park Reserve Agreement between Nunatsiavut and Nunavik Inuit and Parks Canada (Figure 6.3).

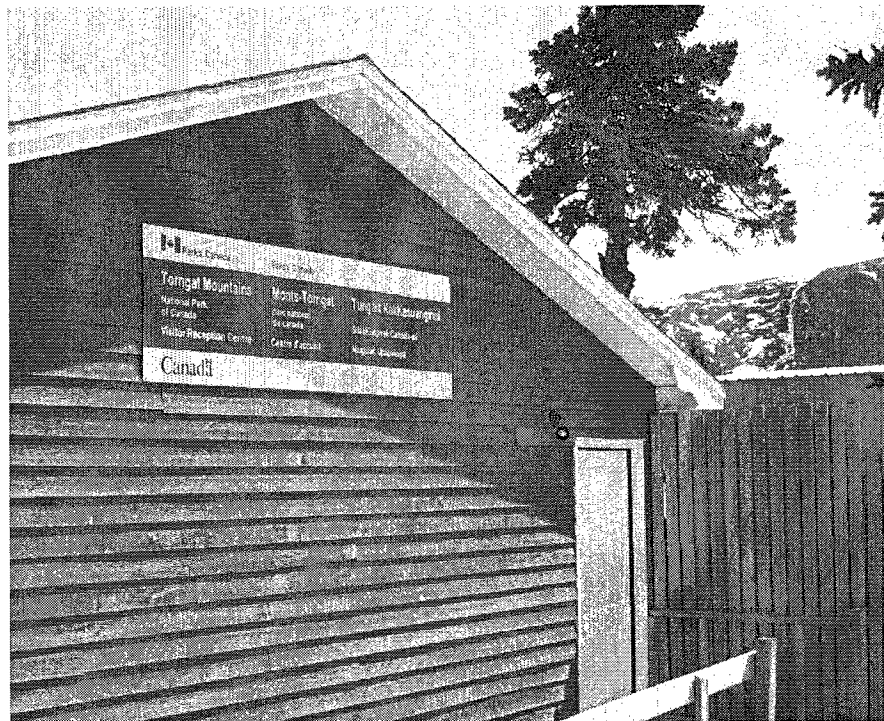


Figure 6.3. Torngat Mountains National Park Visitor Reception Centre, Nain, Nunatsiavut.

The governance of this National Park is unique from other parks and offers an example of a formal arrangement that attempts to draw on Inuit values and principles as well as western scientific management approaches. This is done through hands-on experiences on the land where local Inuit elders, Park superintendents and Nunatsiavut government representatives spend time on land in the park to understand the history and stories of the land. This perhaps informal interaction proves to be highly valuable in the process of making informed decisions about the use of the park. It is apparently working very well to foster a collaborative and cooperative decision making environment that fundamentally includes Inuit values and priorities while also involving decision making concerns of western scientific based governing body of Parks Canada.

One of the key features that makes this arrangement effective and a success for all parties involved in the agreement was raised during one key informant interview:

...all parties were on board, they all believed in the co-management approach...it was the polar opposite of what happened with the Impact and Benefit Agreement (IBA) with Voisey's...
-Regional Government Representative

The Voisey's Bay IBA referred to by this key informant involved much more conflict and opposing perspectives between the Local, Provincial and Federal parties involved. The process of establishing an agreement with regards to the Voisey's Bay Nickel Mine according to one key informant familiar with the events, led to the alienation of the aboriginal peoples who would be impacted by the mine including the Labrador Inuit and Innu Nation. Their issues and interests were talked over by the other parties, making it a difficult process for the Inuit and Innu to ensure their interests were captured in the agreement. This is contrasted with the Torngat Mountain National Park co-management agreement which also involved Labrador Inuit, Provincial and Federal parties, but was instead perceived in a positive light, particularly by the Labrador aboriginal parties. The Torngat National Parks co-management agreement is an example of an alternative approach to decision making processes that could be useful for adaptation to climate change in the context of differing knowledge systems and governance elsewhere in the Arctic.

This chapter has explored the structure and dynamics of the governance systems pertaining to the community of Hopedale's key resources. It has pursued an understanding of the existing capacities and constraints within these identified institutions and finally explored how these shape adaptation to climate and related changes. This chapter provides an analysis of the role of Labrador Inuit Knowledge within and across the scales of governance. This chapter

reveals that facilitating adaptation is likely to be a complex and fragmented process involving adjustments and improvements in existing wildlife and fisheries management approaches as well as social and economic programs. The following chapter summarizes the research findings discussed throughout chapters five and six. The concluding chapter will also suggest the scholarly and practical research contributions and identify some limitations of this research. Finally the following chapter will recommend directions for further research based on the findings made through this thesis research.

CHAPTER SEVEN

CONCLUSION

7.1 Summary of Research Findings

This thesis has undertaken an analysis of the roles of the systems of governance and knowledge which are typical in the Canadian Arctic, in facilitating adaptation to enhance adaptive capacity and subsequently reduce vulnerability to climate and related social, economic and political change, within the community of Hopedale, Nunatsiavut. Through a multi-level analysis, this research has found that the interactions that take place within and in between the governance systems pertaining to Hopedale's resources influence the capacity of individuals and households of Hopedale to either manage change themselves within the community or to communicate to broader levels of government their concerns and priorities to ensure the interests of the community are addressed. It was apparent throughout this research that two distinct knowledge systems are involved within these systems of governance, each with unique perspectives, values and approaches that influence decision making processes. Although decisions pertaining to managing climate change are currently not well developed, it is not clear how these differences will be overcome when decisions regarding managing change become more pressing. It is also clear however, that there are a number of opportunities to enhance capacity and reduce current and future vulnerabilities within the formal and informal institutions. The following section will review the key findings of this thesis according to the four main objectives set out in chapter one.

The main objectives of this thesis are outlined again below:

1. summarize current social-political-economic and environmental vulnerabilities to climate change in the community of Hopedale, Nunatsiavut;
2. document the existing governance structures and systems pertaining to the above identified risks and vulnerabilities;
3. describe and explain the role of local knowledge, including opportunities and limitations, within these governance systems;
4. identify opportunities to enhance adaptive capacity to deal with climate change based on existing systems of governance

7.1.1 Vulnerabilities

It is evident that the vulnerabilities that characterize Hopedale as discussed in chapter five are multifaceted, spanning various social, economic, political and environmental issues. The governance of these issues spans a number of institutions across multiple scales. The main vulnerabilities identified are summarized as follows:

- *Changing accessibility & availability of wildlife and other key resources*

Largely attributed to changing and unpredictable sea ice and snow conditions as well as increasing fuel costs associated with traveling, Hopedale residents are experiencing constraints in their ability to travel on the land and sea and obtain important resources such as fish, wood and caribou. They are dealing with these changes by adjusting their harvest activities and timing. Stocking up on wood during the ideal travel timing is one example.

- *Changing Sharing Networks*

Food sharing networks within the community of Hopedale are being compromised and have become less accommodating for some residents. While food sharing networks continue to provide valuable caribou meat, dried fish and gull eggs, for example, the dynamics of these relationships have shifted to become more demand based and less open to all in the community. Residents can obtain resources through these networks, but now there is less offering of resources or certainty that residents will be comfortable sharing their haul. Similar to changes in resource access and availability, these changes appear to be influenced by the costs now associated with hunting (travel, fuel, equipment), and the lack of certainty about availability of hard to obtain resources such as caribou.

- *Limited Employment Opportunities*

Employment in Hopedale and elsewhere along the coast has been scarce for some time. Despite expectations of job opportunities with the selection of Hopedale as the location of the Nunatsiavut Legislature there continue to be limited prospects particularly for the youth. This is causing concern among residents that youth will be caught between remaining in Hopedale with limited opportunities or relocating to a larger town or city with more job opportunities and leaving Hopedale. Future development in the tourism or energy industry may present new opportunities.

- *Increasing Costs of Living*

Adding to the challenge of limited employment opportunities is the reality of increasing costs of living. The increase is due to a combination of factors including rising fuel costs, high costs of store foods, remoteness from goods and services. Although the costs of living elsewhere in Labrador tend to be lower than the rest of Canada, living costs on the north coast resemble those of Arctic communities across the north. The indirect implications for these costs are crowding of households and a reduction in travel on the land and sea due to limited or no access to a boat or skidoo.

- *Changing Governance Systems*

In the process of becoming self governed, Nunatsiavut has transitioned into a governing system that is unlike what some residents of Hopedale expected. Elders in particular who were used to a system of community elders at one time, are unfamiliar with the formal and often distant system of decision making and feel uneasy about participating in the governance process. Some residents have concerns that the new government has not delivered on their platform promises and they continue to feel that decisions are made ‘outside’ and that they have limited opportunities to influence decisions.

7.1.2 The Role of Governance & Institutions

Many institutions are involved in the broad scale management of resources that pertain to Hopedale residents and these each shape the process and structure of decision making across multiple levels. From the individual to the community level, informal institutions of sharing and harvesting largely have the effect of enhancing capacity of individuals and households to manage changing climatic and other conditions provided that they continue to be adhered to in future. At the regional scale there are components of governance that are working to enhance capacity of

individuals and communities. One example is the Torngat joint and co-management boards which serve the interests of individuals and regional governments to achieve resource sustainability. Sustainability of resources can help to ensure Hopedale residents can access and harvest valuable countryfoods and other resources.

Constraints at this level include discrepancies in Labrador Inuit Knowledge interpretation and integration in management decisions. Although the Nunatsiavut Government is working towards inclusion of LIK in governance, opportunities for integration of LIK may be limited to the governance of Nunatsiavut Government. In cases where a management issue spans regional and provincial governance, LIK may not be taken with legitimacy by all institutions or stakeholders involved. This decreases Hopedale's capacity to fully participate in decision making and design adaptation strategies to their Inuit values and interests.

7.1.3 The Role of Labrador Inuit Knowledge

The role of Labrador Inuit knowledge is manifested differently at each level of governance including Individual, Community, Regional, Provincial, and Federal, and in some cases not at all. Analysis of these differences and similarities is helpful in deciphering how this shapes decision making across and within scales and what this means for facilitating adaptation. Summarizing the research findings regarding the role of Labrador Inuit Knowledge it is evident that differing perceptions of Labrador Inuit knowledge might be a challenge to decision making processes particularly for decisions or adaptation that span different scales.

Labrador Inuit Knowledge builds capacity amongst households and the community. Traditional approaches to using the land and sea involve well developed principles of sustainability, minimal waste and respect for the environment. Sharing and promoting the value

of these practises with the next generation through the school curriculum for example can ensure that the future hunters and fishers have the capacity to deal with the probable changes on the land and sea.

At the regional scale, sharing information across institutions regarding climate change expectations will help all parties and stakeholders be more aware of potential change and how they might best respond. Sharing information from the national scale, particularly regarding future climate change projections, with the regional and local scale can help influence the perception of climate change adaptation planning needs as there is currently minimal planning being pursued to adjust to future changes by most institutions at the local and regional scale.

7.1.4 Integrating Adaptation

Through an analysis of the existing capacities and constraints within and across the scales of governance pertaining to the existing vulnerabilities in Hopedale, this research gained insight into the process of integrating adaptation initiatives and enhancing capacity. It is evident that enhancing capacity may involve implementing new plans or strategies to meet needs associated with existing vulnerabilities such as increasing employment opportunities or implementing harvesting quotas. It is also evident however, that adaptation initiatives can also build on existing factors that are promoting capacity currently. Two examples of existing formal and informal institutions that are facilitating capacity for Hopedale residents include the local sharing networks and the Torngat Management Boards. Through these two examples of governance institutions, informal and formal, Labrador Inuit are obtaining access to country foods and are also having their interests involved in the management decisions pertaining to resources important to them. Ultimately these institutions are beneficial in reducing the vulnerabilities

identified in the community including changes in the availability and accessibility of resources as well as changes in governance systems. This thesis demonstrates that integrating adaptation and capacity enhancing strategies requires a range of adjustments, improvements or even promotion of existing management initiatives as well as considerations for new investments and adaptation plans.

7.2 Scholarly Research Contributions

Both scholarly and practical research contributions have emerged from this research. Within climate change adaptation scholarship, this research provides a unique multi-level institutional analysis of governance systems in an Arctic context, a novel research endeavour in the Nunatsiavut region. In addition, this research identified the influences of formal and informal institutions as well as distinct knowledge systems in facilitating adaptation and enhancing adaptive capacity. Finally, this research contributes to the understanding of the institutional and governance processes involved in mainstreaming adaptation initiatives into existing and evolving institutions in an Arctic context.

7.3 Practical Research Contributions

The practical contributions of this research are also useful. For the community of Hopedale, this research provided an opportunity for community collaboration into identifying community vulnerabilities and stresses as well as the current constraints within governance processes that are hindering the alleviation alleviating these vulnerabilities might be alleviated. This research also identifies current phenomena that contribute to the capacity of individuals and the community to deal with changes and stresses, and also those factors which are currently constraining capacity. These insights are important for decision making processes pertaining to

adaptation as this informs the respective institutions on where to make changes and where to support or continue plans or strategies. An example is in the area of food sharing networks, which could be improved by providing residents with the means to travel to obtain foods or by implementing a community resource pool or storage unit that could be available publicly, which would potentially decrease wastage and decrease their reliance on uncertain food sharing networks.

A further contribution of this research is the insights it offers regarding cross-governance decision making. This research suggests that if differences in governance approaches are overlooked, the values and perspectives that are attached to those are potentially also overlooked. During a period of governance transition across the Canadian Arctic, this thesis further highlights that adaptation to climate and related changes is also a political undertaking. This thesis demonstrates that these considerations should be accounted for at the outset of the decision making process. Finally, this research offers insight into the practical challenges associated with integrating Labrador Inuit Knowledge into decisions made beyond the governance of the community of Hopedale or Nunatsiavut region.

7.4 Limitations & Future Research Recommendations

This thesis undertook an ambitious research scale and scope with the intention of understanding a number of interrelated issues pertaining mainly to the topic of adapting to climate change. To this end, there were challenges and subsequently limitations of the research that should be acknowledged and potentially addressed in future research initiatives. There were three main limitations of this research. These involved the length of the research process, the representation of institutions and limited department specific policy recommendations.

The field research period of this research took place mainly during the months of May, June and July in the summer of 2008. Although the researcher made a preliminary visit to the community during the winter season, this research could have benefited from a longer field season. During a longer field season, the researcher could have potentially been presented with more opportunities to participate in community activities such as the fall caribou hunt, or the late summer berry harvest. Insights into these activities would have provided a more comprehensive understanding of resource use and management in the community from season to season. This would have also helped account for biases in the findings regarding important resources due to the season at the time of interviews. Future research initiatives could benefit from taking an explicit seasonal approach to the research to explore resource use and harvesting in all seasons. Future research initiatives over a longer time period spanning more than one season might also produce new or different findings.

Representation of the numerous interrelated institutions involved in the broad governance system directly and indirectly related to Hopedale was simply not feasible for this study. The diagnostic framework presented by Ostrom for example, also brings to light the impracticality of creating an exhaustive list of related institutions, actors, rules and departments involved in the governance of a particular resource management issue (2007). Attempting to do so for the number of resources identified as important by Hopedale residents was neither feasible nor the purpose of this research. This thesis aimed to understand the broad systems of governance involved in the management of some of those resources important to Hopedale residents. In the process, comprehensive representation or description of all possibly related institutions or actors may have been compromised.

Future research projects could take a sector or species approach to obtain a more exhaustive and perhaps complete picture of specific resource governance institutions. A focus on caribou, wood, Arctic Char or Salmon in particular could be beneficial in determining how the broader institutional and governance dynamics and influences that have been found through this thesis may influence the management and decision making processes of individual species in light of future climate change.

Policy recommendations are often provided by researchers as a concluding contribution for decision makers. For this thesis specific policy recommendation examples were limited. Presenting broad scale policy recommendations for all departments, institutions and stakeholders considered in this research would be ineffective, if possible. Given the number of institutions, departments and actors involved at different scales and their different roles in managing certain aspects of resources in Hopedale, recommendations for each aspect of these governance systems would be presumptuous and not feasible within the time frame for a Master's thesis. Instead, this research offers a broader, multi-scale perspective that is important for all parties and actors involved. Similar to the nature of vulnerability in Hopedale, the precise manifestation of facilitating adaptation initiatives and enhancing capacity will be multifaceted, overlapping and will need to change over time. Research focused on the specific institutions and resource management will likely be of more value in terms of specific policy recommendations directed at management institutions.

In terms of future research directions pertaining to the topics within this thesis, there are several that could be of use particularly in the area of decision making in the Arctic and managing change. This research found that decisions made across institutions are by no means an apolitical process. In the Canadian Arctic where there have been significant political advances

by the Inuit in recent history, it is likely that adaptation initiatives will not occur with Inuit as bystanders in the process, however, so far much of the adaptation literature omits attention to the underlying political tensions in intergovernmental decision making. Future research that further investigates the political aspects of adaptation to climate change in the Arctic would offer more insight into how priorities regarding adaptation are determined and implemented in adaptation initiatives. Additional research in the area of biophysical climate change manifestations at a local level would benefit adaptation decision making for Hopedale residents and the departments within the Nunatsiavut Government to manage the implications of increasing climate change.

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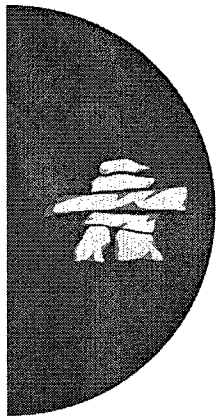
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APPENDIX A –RESEARCH LISCENCE



Nunatsiavut
kavamanga Government

Nunamik amma Nunamiutanik

Lands and Resources

16th May 2008

Laura Fleming
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Dear Ms. Fleming:

Re: Research Proposal - Climate Change Adaptation Management of Wildlife Resources

As stated in the Interim Research Process a review to your proposal was initiated, involving appropriate staff ensuring that all the information we required for a comprehensive review was included in your proposal. The Nunatsiavut Interim Research Committee (NIRC) raised their concerns and you responded.

The NIRC has reviewed your response.

Nunatsiavut Government (NG) is very impressed with your response as we can tell a great deal of effort and progress has been made with the project. You have addressed the concerns NG had with your proposal. NG is confident that you will find appropriate support in Hopedale as the project continues to build upon established community relationships. NG looks forward to future developments on documentation of knowledge captured during your study and innovative ways to effectively involve community in the research process both in methodology and communication strategies. NG specifically likes the addition of the community mapping methodology and considers this will be an interesting project to follow.

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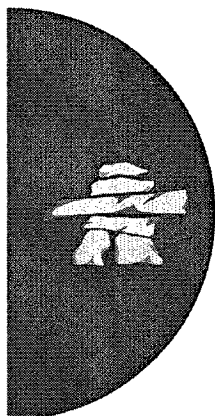
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Nunatsiavut
kavamanga Government

Nunamik amma Nunamiutanik

Lands and Resources

The Committee finds your proposal will be beneficial for Nunatsiavut. Please accept this letter as confirmation of the Nunatsiavut Governments approval for your Research Proposal - Climate Change Adaptation Management of Wildlife Resources.

Nunatsiavut Government is looking forward to receiving a copy of the results of the study after the completion of the project.

Sincerely,
John

John Lampe

On Behalf of the Nunatsiavut
Interim Research Committee
Nunatsiavut Inuit Research Advisor
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APPENDIX B –COMMUNITY INTERVIEW GUIDE

Interview Guide Community Interviews – Hopedale, Nunatsiavut

Harvesting Activities & Conditions (Vulnerabilities)

How long have you lived in Hopedale? Have you lived elsewhere?

Do you hunt/trap/fish/gather? How often?

What resources do you harvest? Why do you harvest these resources?

Where do you harvest resources?

Have you noticed any changes when harvesting? When on the land, sea?

Are you able to pursue harvesting activities the same as you have in the past?

Do you notice any changes about the resources you harvest? Are these changes manageable (for you, for the community)? Why, why not?

Community Use of Resources (Institutions)

How are resources harvested and used in the community? Why?

Are there any rules in the community about harvesting or using resources?

Have you noticed any changes? Describe.

Do you think these will change in the future? How?

Governance, Institutions & Community Involvement (Governance Structures)

Who makes decisions about managing resources?

Are you involved in the decisions about the management of resources?

Are there opportunities for you to participate or contribute your knowledge/experience? How?

Are there barriers/opportunities to your involvement, or participation in these organizations?

Is it important to you/do you want to be able to be involved or contribute?

Does the community have a role?

Future Research Interests

If further research were to be completed here on resources, changing conditions etc, what do you think it should include?

Do you have anything else you would like to add that we haven't discussed?

Do you have any questions?

Do you know of anyone who might be interested in participating in an interview?

Thank you for your time.

APPENDIX C –KEY INFORMANT INTERVIEW GUIDE

Interview Guide Governance Institutions Interviews: Nunatsiavut & Newfoundland & Labrador

Institutional Purpose, Organization & Interactions

What is the overall purpose of this institution? What is your role?

How long have you been with this institution?

Do you work or collaborate with other institutions? Which ones?

Are there any challenges/barriers when working together? Describe them.

If so, why do you think these challenges/barriers exist?

If not, what allows for this type of interaction? What facilitates this interaction?

The Role of Labrador Inuit Knowledge

How does this institution perceive Labrador Inuit Knowledge?

Is LIK involved in decisions made with this institution? How?

Are there opportunities for LIK in decision making processes in this institution?

Are there challenges involving LIK in decision making processes in this institution?

Is it important for this institution to involve LIK?

Managing Changing Conditions associated with Climate Change

Is climate change or related changes a concern for this institution?

How might climate change affect this institution (planning, policy wise)?

Are there existing plans or initiatives that address climate change in this institution?

Will climate change play a role in the future of this organization? How?

Future Research Interests & Conclusion

Is there a need for more research on this topic, or something similar? If so, what?

Do you have anything else you would like to add that we haven't discussed?

Do you have any questions?

Do you know of anyone who might be interested in participating in an interview?

Thank you for your time.

APPENDIX D-INTERVIEW CONSENT FORM

Participant Consent Form for Interviews

Project Title: Management of Changes to Resources and the Role of Inuit Participation

Project Description: This research aims to:

1. Understand how environmental conditions are affecting resources and your everyday life.
2. Identify how these changes are managed and through which organizations & departments adaptation to environmental changes can be addressed and planned.
3. Identify if and how Inuit residents of Hopedale are able to participate or contribute their knowledge and experience into the decision making processes regarding these changes.
4. Identify perceptions of the role of Inuit participation in these decision making processes in contributing towards Inuit self-governance in Hopedale.

Contact Address: Barry Smit, Dept. of Geography, University of Guelph, Guelph, Ontario, N1G 2W1, phone: (519) 824 4120 ext. 52560, email: bsmit@uoguelph.ca. Researchers on this project: Laura Fleming (lfleming@uoguelph.ca), Laura Tozer, (ltozer@uoguelph.ca)

Research Ethics Board Contact Address: S. Auld, Research Ethics Officer, University of Guelph, Guelph, ON, N1G 2W1, (519) 824-4120 ext. 56606, email: sauld@uoguelph.ca.

Statement of informant rights: *I have been fully informed of the objectives of the project being conducted. I understand these objectives and consent to being interviewed for the project. I understand that steps will be undertaken to ensure that this interview will remain confidential unless I consent to being identified. I also understand that if I wish to withdraw from the study, I may do so without repercussions.*

_____ I give permission for digital recording

_____ I desire that my identity and the information I provide be confidential

OR

_____ I desire that my identity be non confidential and that the information I provide be attributed to me

Name (please print): _____

Signature: _____ Date: _____

Signature of witness: _____ Date: _____

APPENDIX E-COMMUNITY SURVEY

MANAGING CHANGE IN HOPEDALE: COMMUNITY SURVEY

Research Lead: Laura Fleming, University of Guelph,
Guelph, ON, N1G 2W1, lfleming@uoguelph.ca

Dealing with Environmental Change and Changes in Resources in Hopedale

1. What harvested resources are important to the community? How? Why?

2. Have there been any changes regarding these resources?

3. What role do you think the community can have in dealing with environmental changes in the future?

4. What role do you think management organizations can have in dealing with environmental changes in the future?

5. Is it important to you that the community contributes/participates in decisions about dealing with changes? Why?

THANK YOU FOR PARTICIPATING

If you would like to participate in an interview, please write your name: _____