

**University of Alberta**

“Governance Institutions and the Capacity to Adapt to Climate Change in Two  
Rural Communities in Alberta”  
by

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## **Abstract**

Adaptation is now recognized as an important aspect of responses to climate change. Rural communities in the prairie provinces of Canada are considered to be sensitive to the impacts of climate change due to socio-economic and geographical factors. This study examines the ways in which governance institutions shape the ability of two rural communities in Alberta to adapt. 32 semi-structured interviews were done with decision-makers in the communities of High Level and Canmore, and with provincial-level governance actors. A vast array of secondary documents was also examined. The comparison of these two case studies shows that institutional capacity in Canmore supports proactive adaptation. In contrast, several features of governance institutions in High Level detract from adaptive capacity. Provincial governance institutions were found to contribute both positively and negatively to the capacity of rural communities to adapt to climate change.

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# **1 Introduction**

Despite considerable effort to reduce global greenhouse gas emissions (GHG), output continues to rise (World Meteorological Organization 2007). The Intergovernmental Panel on Climate Change (IPCC) anticipates that by the end of the 21<sup>st</sup> century, current GHG trends will result in a mean global temperature increase of between 1.8 and 6.4 degrees Celsius (IPCC 2007). Scientists anticipate that global warming will cause substantial regional impacts including warming temperatures, contracted snow cover, major changes in ecosystem function and structure, more intense storms and droughts, a rise in sea level, along with many other impacts (IPCC 2007). The United Nations also anticipates that by 2100 there may be as many as 50 million environmental refugees globally and that this number could eventually rise to hundreds of millions as the impacts of climate change intensify (UNU-IEHS 2005).

As scientific consensus about the risks associated with climate change grows, attention has shifted to response issues (IPCC 2001). Responses can generally be grouped into two categories: mitigation and adaptation. Mitigation refers to the reduction of emissions or the capture of GHGs to reduce future risks, while adaptation refers to the adjustment of structures, practices and processes in response to climate change (IPCC 2001).

From both a scientific and a policy standpoint, mitigation has received substantially more attention than adaptation (Thomalia, Downing, Spanger-Siegfried, Han, and Rockström 2006). Fussler and Klein (2006) suggest that

mitigation has been a popular topic because of its appeal to fairness. It applies the polluter-pays principle whereas adaptation is needed most by those who have contributed the least to the problem. Mitigation also helps to reduce the impacts on all systems while adaptation potential is limited for many systems. Mitigation is also easy to monitor and measure than adaptation.

There is now a concerted effort being put into “mainstreaming” considerations of adaptation in science and policy (Adger et al. 2007; Burton, Huq, Lim, Pilifosova, and Schipper 2002; Smit and Wandel 2006). The importance of integrating adaptation into governance is great because there is a need to adjust to the impacts of climate change that will occur as a result of past GHG emissions (Fussler and Klein 2006). Adaptation measures will also have more-immediate benefits than mitigation such as the reduction of risks associated with current climate variability. Research that can contribute to knowledge about adaptation and vulnerability will therefore be vital to inform the science of climate change, the development of subsequent policy strategies, as well as daily governance decisions.

### ***1.1 Purpose of the Study***

Institutions have been identified as an important factor for vulnerability and adaptation to climate change (Adger 1998, 1999, 2003; 2006; Adger and Kelly 1999; Brooks and Adger 2005; Kelly and Adger 2000). Institutional analysis in this field has nonetheless remained fairly limited. Research has primarily focused on the regulative nature of institutions and has yet to explore

the normative and cognitive role that institutions play in regulating adaptation to climate change. In particular, vulnerability and adaptation research has failed to examine the crucial role that culture, worldviews and values play in how the risks of climate change are understood and acted upon at the community level. This gap in vulnerability and adaptation literature has constrained the contribution of institutional analysis to broader knowledge about institutional capacity to deal with the impacts of climate change.

There is also much research needed to understand how these institutional elements can pose barriers for the reduction of vulnerability and engagement in effective adaptation. Research that will broaden knowledge about the relationship between the variables thought to contribute to vulnerability and the capacity to adapt to the impacts of climate change is thus required. It is to this aim that the research described in this paper attempts to contribute. The study focuses on one type of population, rural communities, thought to be of the most vulnerable in the Prairie Provinces of Canada (Davidson, Haan, and Parlee 2008; Davidson, Williamson, and Parkins 2003; Sauchyn and Kulshreshtha 2007). The research explores the relationships between the local institutions of governance and the adaptive capacity of two rural communities in Alberta.

According to Alberta Municipal Affairs (2009a) the designation "rural" includes farm and resource-based areas as well as municipalities that contain substantial country populations. There are 110 towns in the province of Alberta with populations ranging from 1000 to over 10,000 (Alberta Municipal Affairs 2009a). The two communities chosen for this study were the towns of High Level

and Canmore. They are thought to have diverse sources of vulnerability as well as divergent adaptive capacities. This is because population, proximity to a major urban centre, resource dependence, education, and income indicators are different (reviewed in Chapters 3 and 4). They suggest that High Level would be more vulnerable to the impacts of climate change than Canmore because High Level has an economy that is highly resource-dependent, the population is much smaller, it is located much farther away from a major urban centre, educational attainment is lower, and a high proportion of the population is Aboriginal (see Table 1 in Chapter 3).

Semi-structured interviews were carried out with decision-makers in various governance organizations in the communities as well as at the provincial level. The organizations were prioritized based on the climate change risks that are expected for the province and purposefully sampled by top priority. Thirty-four participants were interviewed in total; twelve were from High Level, thirteen from Canmore, and nine from organizations involved in provincial governance.

The analysis is guided by institutional theory which concerns the rules and processes that organize social life or the social constraints that affect human interaction (Homer-Dixon 1999). A broad framework of institutional analysis devised by Scott (2008) is used to understand the regulative, normative and cultural-cognitive foundations of institutions in a community context. In particular, this research focuses on governance institutions which are the established rules of governance that structure the interactions of those operating within them, based upon shared beliefs and values. Governance institutions have

been identified as having a significant influence on a community's ability to diversify resource use, encourage alternative economic activities and lifestyles, and promote social resilience (Adger 2006; Adger, Hughes, Folke, Carpenter, and Rockström 2005).

## ***1.2 Research objectives***

The study had three objectives:

1. To contribute to the limited understanding of the role that governance institutions play in climate change adaptation
2. To identify the institutional characteristics of governance important for adaptation in rural communities in Alberta.
3. To determine the implications of these institutional characteristics for the capacity to adapt to the impacts of climate change.

The research questions that were the focus of this study are; 1) what are the regulative, normative, and cultural-cognitive governance contexts in these two rural communities 2) what are the symbolic systems, cognitive scripts, and moral templates that structure local governance 3) how do governance institutions structure understanding of climate change within the community and influence decision-making about the appropriate ways to address the impacts of climate change 4) what kind of repercussions do governance institutions have for adaptive capacity?

### ***1.3 Significance of the Study***

The study provides valuable information about the role that institutions play in community vulnerability and adaptive capacity, both generally and more specifically in the case of rural communities in the province of Alberta. This information can inform both policy and decision-makers so that the regulative, normative, and cultural-cognitive dimensions of institutions that exist in rural communities can be considered in the development of future adaptive strategies. In this way, the negative impacts of climate change can be dealt with in a more holistic fashion that may aid the effectiveness of these strategies. This study also contributes valuable information to the literature on vulnerability and adaptive capacity that can inform future research and theory development.

## **2 Literature Review**

### ***2.1 Adaptation***

Smit and Wandel (2006) argue that there are numerous definitions of adaptation, particularly in the climate change literature, but that most definitions centre on a common theme. They define adaptation as “a process, action or outcome in a system ... in order for the system to better cope with, manage or adjust to some changing condition, stress, hazard, risk or opportunity” (p. 282). They note that the concept of adaptation has been used in several different disciplines including both the natural and social sciences, and that analysis of adaptation to climate change has been undertaken for a variety of purposes. In particular, they distinguish between four different groups of adaptation research.



The purpose of the first group of adaptation research is to estimate the amount of projected impacts that could be offset by specific adaptive actions. The second group of investigation focuses on specific adaptation options and attempts to determine the usefulness of different options for a given system and to identify the best alternative. The third group of research examines the relative competence of different countries, regions, or communities to adapt to climate change. The intention of this type of investigation is to compare these evaluations or ratings based on criteria, indices and different variables so that the systems with the greatest vulnerability or least adaptive capacity can be identified. The purpose of the fourth type of adaptation analysis is to contribute to practical adaptation projects or plans by investigating the channels through which they can be implemented or improved. The objective is to record the ways that the system undergoes or experiences change in order to facilitate customized adaptation and improved adaptive capacity in a fashion that meets the needs of the community.

Smit and Wandel (2006) suggest that the bottom-up approach used in the fourth type of adaptation analysis makes this body of research distinct. Particular variables are not presumed to be important for a community of interest but instead the knowledge and experience of community members is often called upon to identify the contextual features that are of significance. Smit and Wandel argue that this feature of the research can help to facilitate adaptation efforts and “mainstream” the consideration of climate change risks and opportunities into decision-making at a practical level. This type of research is not common within adaptation research or the climate change field. Rather, Smit and Wandel suggest

that it is more frequent in the fields of resource management, community development, risk management, planning, food security, livelihood security, and sustainable development that deal with actual practices and processes of adaptation.

Within the literature, an array of approaches has been mobilized in an attempt to generate integrative and collaborative science and to move towards more sustainable development (Folke 2006). In the context of climate change, several concepts have been used to better understand adaptation including vulnerability, resilience, and adaptive capacity (Adger 2006; Adger et al. 2007; Nelson, Adger, and Brown 2007). These concepts are reviewed in the following sections.

## **2.2 *Vulnerability***

Fussler and Klein (2006) distinguish between three main approaches to climate change vulnerability assessment based on the means of conceptualizing key concepts and their analytical approach. The main models identified are the adverse effects model, the risk-hazard framework, and the social constructivist framework.

### **2.2.1 Adverse-Effects Model**

Fussler and Klein categorize the definition of vulnerability found in climatic studies and originally endorsed by the IPCC as distinct. Vulnerability is defined as

the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change ... (it) is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2001, p. 388).

The term “exposure” used in this definition refers to the degree and character of climactic variations, while the term “sensitivity” denotes the degree to which a system is affected (Fussel and Klein 2006). This definition of vulnerability is dependent on estimates of future climate change and potential adaptation. An assessment of vulnerability using this definition occurs at the end-point of a series of analyses whereby any residual impacts that remain, after estimated exposure and adaptation occur, define vulnerability (Kelly and Adger 2000).

Vulnerability is characterizes as an outcome rather than a process and the causes of vulnerability are assumed to be static and quantifiable (O’Brien, Eriksen, Schjolden, and Nygaard 2004). This approach also reflects the belief that humans have the ingenuity and technological ability to predict reality (Diaz, Rojas, Richer, and Jeannes 2005). Subsequently, knowledge is assumed to be created by scientists and understood by those with post-secondary education, and the adaptive strategies envisioned in this positivist paradigm are therefore created and implemented in a top-down manner (Diaz et al. 2005).

### **2.2.2 Risk-Hazard Model**

The risk-hazard framework defines vulnerability as the relationship between an external hazard and the outcome of that hazard on the system (Fussel and Klein

2006). Vulnerability is treated as an over-arching concept and risk is separated into two components; the biophysical dimension which is equivalent to exposure and the social dimension which is comparable to capacity (Blaikie, Cannon, Davis, and Wisner 1994, referenced in Kelly and Adger 2000). The characterization of vulnerability must always be linked to a specific hazard however the biophysical component is located outside the actual definition (Kelly and Adger 2000).

The assessment of vulnerability in this tradition integrates physical science, engineering, and social science to explain the links between environmental risks, human responses, and the social parameters of risk (Adger 2006). The focus has traditionally been on technological solutions to exposure and events however a longer-term anticipatory approach that resembles the perspective of vulnerability taken within climate change research is increasingly being used (Thomalia et al. 2006).

### **2.2.3 Social-Constructivist Model**

Another view of vulnerability, found in what Fussel and Klein (2006) call the social constructivist framework, is popular in political economy and human geography. Kelly and Adger (2000) use the term ‘social vulnerability’ to emphasize the human dimensions and constraints that limit the capacity to respond to stress effectively, independent of any future threat. They define ‘social vulnerability’ as “the ability or inability of individuals and social groupings to

respond to, ... cope with, recover from or adapt to, any external stress placed on their livelihoods and well-being” (2000, p. 328).

Kelly and Adger (2000) argue that this perspective allows the focus to shift away from the elements of exposure onto the social, economic and institutional elements of vulnerability so that analysis can explore how these factors shape the ability to adapt. Exposure sets the context for analysis however it is not necessary to define the nature of the potential event or the likely adaptive processes (Kelly and Adger 2000). Physical and biological systems tend to be largely ignored in this approach and the focus remains almost entirely on the social aspects of vulnerability (Adger 2006). By removing speculation about future scenarios and concentrating on the processes that limit or support the ability to respond to stress, social vulnerability is argued to be a more robust concept (Kelly and Adger 2000).

The social constructivist paradigm is based on the belief that reality is socially constructed and that individuals have lenses through which they experience the world around them (Diaz et al. 2005). Vulnerability is considered to be a dynamic pre-existing situation that is influenced by socio-economic and political factors that change and interact (O’Brien et al. 2004). Therefore vulnerability is considered context-dependent and adaptation must take different perceptions of climate change into account. Adaptive processes are thus likely to be fashioned and implemented at the community level in a bottom-up collaborative manner that is based on local circumstances (Diaz et al. 2005).

The research described in this study takes the social-constructionist approach to vulnerability and focuses on the social dimensions of vulnerability.

Specifically, it looks at adaptive capacity and the role that the institutions of governance play in determining the capacity of communities to adapt to climate change.

### **2.3 *Adaptive Capacity***

Adaptive capacity refers the ability of a system “to adjust its characteristics or behaviour in order to expand its coping range under existing climate variability, or future climate conditions” (Brooks and Adger 2005, p. 168). A system that is more exposed and sensitive to climatic hazards is considered to be more vulnerable but a system with more adaptive capacity is thought to be less vulnerable all else being equal (Smit and Wandel 2006).

Adaptive capacity encompasses both the set of resources available for adaptation and the ability of the system to use those resources effectively (Brooks and Adger 2005). Beckley, Martz, Nadeau, Wall, and Reimer (2008) present a highly-generalized conceptual model of community capacity that is useful in understanding how resources and their use influence community capacity. Their model is not targeted at adaptive capacity specifically however it speaks to the processes and relationships that are crucial to understanding adaptive capacity. It examines community assets that are important for capacity, the catalysts required to mobilize these assets for a specific purpose, and the relational spheres in which they are organized.

The authors argue that the description of community capacity centres on the question “the capacity to do what?” Rather than focusing on the capacity to

deal with the predicted impacts of climate change, research on vulnerability and adaptive capacity has increasingly focused on the pressures that already challenge community capacity such as existing environmental and social problems (Smit and Wandel 2006). This emphasis has the potential to highlight social and institutional stresses and processes that can lead to threshold changes and resilience in socio-ecological systems (Adger 2006).

Beckley and his co-authors list economic, social, natural and human capital as the resources available to communities, however other resources including technology and cultural capital have been described as being important for adaptive capacity (McLeman and Smit 2006; Pelling and Uitto 2001; Bass 2005). Some of these resources shall be examined in subsequent subsections of this paper however they should not be considered to be autonomous. Rather they interact to shape the sensitivities, adaptive capacities and vulnerabilities of different places in diverse ways over time. In other words, they are context dependent and community specific (Smit and Wandel 2006).

Beckley et al. (2008) remind us that resources alone do not equate to capacity; instead capacity is developed and diminished by enacting assets in reaction to changing circumstances. They label potential reasons for action as opportunities and threats which incite communities to mobilize resources towards desired outcomes. Climate change can be seen as both a threat and an opportunity and it is likely that there will be differences of opinion about this within a community (Beckley et al. 2008).

Finally, Beckley et al. (2008) contend that the mobilization of capital resources for purposes such as adaptation will occur within the framework of existing social relations that have distinctive norms, rights and entitlements. Namely, these spheres of social relations guide decision-making and behaviour and will set the context in which community assets are organized and put to use. Therefore they are an important aspect of community capacity.

One of the main social spheres in which climate change will be addressed is that of community governance. Traditionally, governance referred to government but it has now come to encompass a broader style of governing that involves multiple public and private actors contributing to the conditions of ordered rule and collective action (Stoker 1998). Community governance includes a wide variety of members who participate in the use of resources to address different social, economic and environmental opportunities and challenges.

Community capacity also depends on exogenous factors occurring within the wider context in which the community is embedded (Brooks 2003). It is linked to and to some extent co-dependent on the capacity of the region in which it is located as well as the capacity of the households and individuals within it (Smit and Wandel 2006). Taking these broader decision-making networks into account can draw attention to the role that decision-making at multiple levels of governance play in adaptive capacity (Keskitalo and Kulyasova 2009).

The ways in which members of a community interact and participate in governance along with how they work together with external governance actors will be determined by existing social rules. Investigations of the institutions that



shape adaptive capacity are thus a central aspect in the investigation of adaptive capacity, vulnerability and adaptation. Institutions link the different levels of governance and play a determining role in how different resources are used and by whom (Adger and Kelly 1999).

### **2.3.1 Social Capital**

Generally speaking, social capital concerns norms and networks that are the basis for collective action (Woolcock and Narayan 2000). Brooks and Adger (2005) list the indicators of social capital as strong institutions, transparent decision-making systems, and formal and informal networks that promote collective action. While there are a wide variety of theories regarding the processes and outcomes of social capital, it is commonly recognized that collective action is bound up in decision-making predicated on the connections and the flow of information between individuals and groups (Adger 2003).

Several different types of social capital are described in the literature however two (bonding and bridging) are most common. Relationships between individuals within a defined socio-economic group, such as family, close friends and neighbours within a community, are labelled “bonding social capital” (Adger 2003). These ties exist between individuals that share a common identity (Pelling and High 2005). “Bridging social capital” refers to connections between demographically comparable individuals, and may be based on weaker bonds of trust or reciprocity (Woolcock and Narayan 2000). Often these relationships are shared by people with contrasting social identity but common interests or goals (Pelling and High 2005).

In the current study both bonding and bridging social capital are described for members of the same community and are referred to as “horizontal community networks”. The term “horizontal regional networks” is used to describe bridging social capital for members of different communities within the same geographic region. Finally, “vertical networks” refers to bridging networks between governance actors within the communities and higher-level governance actors in positions of power outside the community (Naryan 1999; Pelling and High 2005; Woolcock 2001).

Adger (2003) argues that this last type of social capital, networks between actors within a community and the higher-level formal institutions of the state, forms an important link between social capital and adaptive capacity. Building on the ideas of Woolcock and Narayan (2000), Adger describes four extreme cases of the relationship between the state and community level social capital to show how different levels of social capital can contribute to adaptive capacity. The four cases are 1) a well-functioning state and low levels of networking social capital, 2) a well-functioning state and higher levels of networking social capital, 3) a dysfunctional state with low levels of social capital, and 4) a dysfunctional state with high levels of social capital. In the first case, state intervention can compensate for low networking social capital by providing support to marginalized groups, thereby boosting adaptive capacity. The second case, a well-functioning state matched with high networking social capital, is ideal because social and policy learning can occur and will contribute positively to adaptive capacity. This is still dependent on the existence of a collaborative relationship

between the state and civil society however (Evans 1996, referenced in Adger 2003). In the third case, a dysfunctional state combined with low social capital, conflict can occur and marginalized groups can become more vulnerable. In the fourth case, high social capital can compensate for a dysfunctional state however Adger warns that this situation does not necessarily result in the development of adaptive capital. Rather, high levels of networking social capital can lead to the fortification of criminal and corrupt networks in the absence of effective state intervention.

Adger concludes that social networks play a key role in the ability to act collectively but that the relationship between the state and a community is of particular importance, and therefore a major part of adaptive capacity. He surmises that strong social capital at the community level can facilitate collective community action and contribute positively to adaptive capacity. Governments nonetheless will ultimately have an effect on what happens at the community level. High levels of social capital may offset some of the negative effect of an absent state on adaptive capital but without it the chances for successful adaptation will be low. The state can also contribute positively to adaptive capacity when there is collaboration with local collective efforts and strong vertical networks.

### **2.3.2 Economic Capital**

Economic capital typically refers to physical and financial assets like infrastructure, utilities, and public and private monies (Beckely et al. 2008). This

study uses a broader conceptualization of “resource entitlements” in order to capture a more encompassing variety of means that can be used to access resources (Sen 1981). Entitlements are the actual or potential sources of welfare, income or resources that are available to people through their own production, assets or reciprocal arrangements; be they realized or latent (Adger 2006). The source of resource entitlements, their distribution and the context in which entitlements are formed, contested and distributed over time are thus important factors for adaptive capacity (Adger and Kelly 1999).

The concept of resource entitlements was first developed by Sen (1981) in regards to vulnerability to food insecurity and famine. He argued that vulnerability can be understood in terms of the variety of means that can be employed to access resources and he discussed three types of entitlements; direct entitlement (direct access to resources), indirect entitlement (purchasing access to resources) and transfer entitlement (donation or transfer from others). Sen argued that entitlement failure can occur directly through crop failure or natural disasters or that they can arise indirectly through unemployment, failing wages, rising prices, or inflation. Regardless by which means they occur, entitlement failure makes certain resources unattainable and the results can be severe. For example, famines and food insecurity are increasingly thought to result from a breakdown in resource entitlements rather than from a shortfall in food production (Adger 2006).

Adger and Kelly (1999) argue that the degree to which different social actors are entitled to utilize resources determines their ability to cope with and

adapt to stress. They suggest that social vulnerability compromises individual and collective features that are connected through institutions. The major indicators of vulnerability at the individual level are argued to be poverty and resource dependence. Poverty is said to have a direct association with access to resources which is a factor for baseline vulnerability and for the ability to cope with the impacts of hazards. It is also related to marginalization and a lack of access to resources which are significant when faced with the risk of extreme events. Adger and Kelly also argue that poverty affect peoples' perceptions of the risks and their ability to lessen the risks and recover from events. Resource dependence refers to reliance on a narrow range of resources which can lead to social and economic stresses manifest in the instability of income and failure of some income sources (Adger and Kelly 1999).

Adger and Kelly (1999) argue that social vulnerability at the collective level is determined by the relative distribution of income; access to and diversity of economic resources and formal and informal institutional coping mechanisms. They suggest that trends in the distribution of resources across a population and institutional changes that either reduce or exacerbate vulnerability are indicative of collective vulnerability. In particular, increasing inequality between individuals or groups is argued to amplify collective vulnerability to climate change as it constrains coping strategies and is associated with increased poverty. Thomalia et al. (2006) explain that the people most vulnerable to natural hazards tend to belong to particular social groups such as women, the elderly, children, ethnic and religious minorities, and single-headed households, as well as those people that

are engaged in marginal livelihoods, socially excluded groups and those with insufficient access to economic and social capital. Many poor and marginalized people are also directly dependent on a narrow range of ecosystem services making them particularly vulnerable to environmental changes (Canadian Senate Standing Committee on Agriculture and Forestry, 2003; Thomalia et al. 2006). Coping strategies employed by the community and individual members to reduce the influence of resource dependence and enhance resilience are thus important to observe (Machlis, Force, and Burch 1990).

### **2.3.3 Natural Capital**

Wall and Marzall (2006, p. 379) define natural resources as “the endowments and resources of a region belonging to the biophysical realm.” Natural capital consists of three major components; 1) non-renewable resources, 2) renewable resources, and 3) environmental services (Berkes and Folke 1994). The sustainability of a community, in terms of the direct need for clean air, water and other resources as well as wellbeing gained through economic and spiritual activities, depends on the sufficiency of its natural resource base (Wall and Marzall 2006).

Berkes and Folke (1994) argue that natural capital is the basis or pre-condition for cultural capital. In other words, human experiences with the natural environment in-part shape our beliefs and culture. Cultural capital, they argue, in-turn determines how humans treat the environment and how they use natural capital to create other forms of capital like economic and technological assets. If

the capitals derived from natural capital mask the direct dependence that humans have on the natural world, Berkes and Folke argue that it can lead to resource depletion and environmental degradation. Conversely, capital derived from the recognition of the connection between natural and social systems may lead to better management of natural capital stocks.

Historically, environmental management has been based on the assumptions that ecosystems respond to human effects in linear and controllable ways, and that social and natural systems can be treated separately (Folke et al. 2003). Increasingly however, the connections between social and ecological systems are being recognized and integrated into management and planning. Environmental management, for example, was traditionally linked to economic wellbeing through the creation of commodities but it is becoming more and more known for its link to the provision of natural amenities and environmental services (Beckly et al. 2008).

Management of socio-ecological systems are increasingly applying the idea of resilience. According to Folke et al. (2003), the concept refers to the degree of shock that a system can absorb without changing shape, its capability for self-regulation and its ability to develop capacity through learning and adaptation. More resilient systems are capable of incorporating more stress without extreme changes and in the face of dramatic change they can retain the supply of key ecosystems services. Folke et al. (2003) suggest that socio-ecological resilience is associated with management for a greater range of species,

human opportunities, and economic options that can help to sustain and support adaptation and learning.

#### **2.3.4 Human Capital**

Human capital refers to the collective skills, knowledge and life experience of individuals in a community including; formal education, job experience, expertise, entrepreneurship, leadership, indigenous knowledge, health and physical capacity among other factors (Beckley et al. 2008; Brooks and Adger 2005; Wall and Marzall 2006). Human capital can contribute positively to adaptive capacity in that the more human resources available the more likely that individuals will be able to respond to the risks, challenges and opportunities facing their communities (Wall and Marzall 2006). Increased education for example, may enhance an individual's chance of getting information about climate change impacts and therefore increase their ability to appreciate and prepare for them (Wall and Marzall 2006). The ability to design and implement effective adaptation strategies will also be an important factor for adaptive capacity (Brooks and Adger 2005).

#### **2.3.5 Cultural Capital**

Bourdieu (1986) argues that cultural capital or specific forms of knowledge, skills, education, and advantages that a person has can be considered a resource capable of being used to achieve outcomes such as the generation of economic capital or the sustainable management of natural capital. He describes



three sub-types of cultural capital; embodied, objectified, and institutionalized. Embodied cultural capital refers to individual attributes that are acquired consciously and passively through socialization while objectified cultural capital concerns physical objects that symbolize cultural capital. Institutionalized cultural capital refers to the beliefs, values and worldviews that are recognized and considered legitimate within an institutional context.

Cultural capital, according to Bourdieu, takes time to accumulate and has a tendency to persist in ways that structure and govern social functioning. Specifically, he argues that the accumulation and transmission of cultural capital tends to perpetuate social inequalities. Institutions of governance position certain sets of beliefs, values, norms, and worldviews as being more valuable than others which will play a role in how communities identify and address issues such as environmental sustainability and climate change. For example, unsustainable behaviour can be linked to the high cultural value placed on particular forms of capital accumulation such as consumerism and those that treat environmental costs as externalities (Karol and Gale, 2004). Cultural capital can thus be used to achieve resilience by increasing the importance placed on the environment and climate change. In other words, the institutionalization of cultural capital that speaks to climate change and reflects a belief that it must be addressed will contribute positively towards adaptive capacity. On the other hand, institutions can detract from adaptive capacity when institutionalized cultural capital precludes the integration of climate change knowledge and action.

In the social sciences, several cultural frameworks have been developed that can be used to understand how culture shapes environmental behaviour and action. These characterizations can be used to understand how people with similar values or beliefs perceive and conceptualize environmental issues and the ways in which to address them. Some of the cultural dimensions of institutions that may be important for adaptive capacity include individualism and collective values, beliefs about the relationship between humans and nature (Dunlap and Catton 1994; Diaz et al. 2005), personal responsibility to take action (Brooks and Adger 2005), and other environmental, economic and social values (Morito 2006).

One such typology was devised by anthropologist Mary Douglas (1970, 1982, 1996). It delineates culture according to group allegiance (the strength of people's attachment to their community) and grid control (the network of behavioral directions imposed by a culture). Four prototypes emerge from this model, each with distinct orientations to social life and beliefs about nature. The first group is equalitarians or those that voluntarily accept guidelines about group unity. They are concerned with the distribution of costs and benefits in society and they promote equality, consensus-based decision-making and justice. Egalitarians see nature as fragile and in need of protection. The second prototype is an individualist. Individualists are those that desire autonomy and freedom from social control and so they prefer market-based solutions in lieu of government regulation. They believe that nature is benign, resilient and existing for human use. Hierarchists make up the third group. They are those that prefer many rules and believe that society should be run by experts and those with virtue.

Hierarchists tend to see nature as problematic when badly managed and benevolent when well managed. Finally, fatalists are those individuals that believe that individuals have minimal power in the world and they see nature as variable and unpredictable.

These non-issue-specific cognitive orientations or “general environmental beliefs” are assumed to be the foundation for environmentally-significant behaviour and perceptions of environmental risk (O’Connor, Bord, and Fisher 1999). This is because people with different worldviews are thought to identify and define risks based on their assumptions about the ideal nature of society and their preferences for policy response (Leiserowitz 2006). Cultural theorists for example, often claim that egalitarians are generally more risk-averse when it comes to environmental threats in comparison to those with other cultural orientations (Pendergraft 1998). They are also assumed to be more likely to take personal action as well as supporting government action to address environmental issues (O’Connor et al. 1999).

Diaz et al. (2005) argue that most ideological constructs regarding climate change can be located within one of the four petals of a “paradigmatic flower”. The two axes of the flower contrast individualistic and socially-orientated values with human-centered or anthropocentric ideologies. The first axis centers on the value placed on individual versus collective well-being or equality, similar to the typology reviewed above. The second axis regards the way that humans are believed to be related to their environment (Diaz and Rojas 2006). On one end of the continuum is an anthropocentric, human-centered perspective which asserts

that human beings are uniquely superior to other species because of culture, innovation and ingenuity. Humans are envisioned as being unbound by biology and environmental power, having complete control over their own destiny, and therefore being dominant over nature (Dunlap and Catton 1994). Nature is believed to exist with the purpose of satisfying human wants and needs (Diaz et al. 2005). At the other end of the axis is the bio or eco-centric perspective which asserts that nature has intrinsic value and situates humans within the environment.

The culture of community governance will inform how community resources are managed and mobilized to address climate change and its impacts (Diaz and Rojas 2006). Diaz et al. (2005) argue that those with anthropocentric perspectives will consider the effects of climate change in terms of their relevance to human systems only. They may for example, use contingent valuation to determine the use value of different resources. The eco-centric perspective, on the other hand, considers the affects that climate change will have on all aspects of the ecosystem. Management in this context may explore the ecosystem services of different resources in terms of the contribution to overall ecosystem health.

The acceptability of governance and management approaches to climate change will also depend on how community members and governance actors perceive the potential risks to their community. Although it was previously thought to be the case, providing the public with more information about the risks of climate change does not necessarily lead to more concern or to expected behaviours such as support for policies to reduce GHG emissions (Leiserowitz 2006). The literature regarding the relationship between information, cognition,

and individual response to climate change similarly shows that knowledge of climate change causes, impacts and solutions does not necessarily lead to proactive adaptation (Adger et al. 2007). Rather, the type of content that people receive and how this information is salient to them plays an important role in how people acquire knowledge and in how they use it (Malka, Krosnick, and Langer 2009). Scientific and technical descriptions of the dangers of climate change may inform public perceptions of risk, however psychological and cultural factors will also play a significant role in risk perceptions and subsequent behaviour (Slovic 2000). Climate change for example, is often associated with other mental constructs like ozone depletion, air pollution and experienced temperature variation (Bostrom, Morgan, Fischhoff, and Read 1994; Dunlap 1998; Frick, Kaiser, and Wilson 2004; Kempton 1991; Nisbet and Myers 2007).

Accordingly, perceptions of climate change risks within a community may be inconsistent (Adger et al. 2007). The cultural features of forest-based communities in northern Canada for instance, are thought to constrain perceptions of climate change risks, despite scientific assertions that these ecosystems are among those most at risk to the impacts (Davidson et al. 2003). Willingness to adapt and consensus about what adaptive responses are appropriate may be constrained by the diverse ways in which risks are perceived. Disagreement about the impacts of climate change can hinder adaptive responses and a refusal to accept the risks associated with climate change or to accept responsibility for adaptation will ultimately undermine adaptive capacity (Brooks and Adger 2005).

## **2.4 Institutions**

An institution can broadly be defined as a system of recognized social rules that structure human interaction (Hodgson 2006). The concept of an institution is highly contested (Adger 2000), because the idea encompasses such a wide range of structures from worldviews and socialized interactions to bureaucratic organizations (Jordan and O’Riordan 1995). In other words, the form that an institution takes can range from the highly formalized to the more diffuse and informal. Institutions can be manifest in formal laws and contracts, but they can also comprise more informal frames of reference such as moral patterns, norms and cultural symbols (Jordan and O’Riordan 1997).

Pahl-Wostl (2009) argues that ‘formal’ and ‘informal’ refer to the processes of development, codification, communication and enforcement. She claims that formal institutions are associated with government bureaucracies and that they are codified in regulatory frameworks and other legally-binding processes. Conversely informal institutions, she argues, refer to shared rules and norms that are not normally codified and are instead enforced through channels other than those that are legally sanctioned.

Most disciplines have their own definition of an institution and distinct explanations of how institutions structure behaviour, and how or why they are created, changed and concluded (O’Riordan and Jordan 1999). A ‘new institutionalism’ emerged in the 1960s and 1970s across several social science disciplines that shared an emphasis on the importance of institutions in structuring behaviour. New institutionalism however, was not considered to be a unified body

of thought because each theory has distinctive epistemological and ontological perspectives (Hall and Taylor 1996).

Despite its broad meaning and the many ways that the concept of an institution has been applied in analysis, Jordan and O’Riordan (1995) note that there are several interrelated ideas that surround the meaning of an institution. Institutions embody rules that reflect values, norms and worldviews. They represent cognitive and normative structures that determine what is real as well as appropriate, legitimate and proper. They regulate behaviour through socially-legitimized mechanisms. An example of this is the creation of scientific knowledge; the interpretation of this knowledge and the selection of responsive policies, all of which are socially legitimate channels through which behaviour regarding climate change is regulated (O’Riordan and Jordan 1999). Institutions also provide meaning and context as well as a sense of purpose. They encapsulate patterns of routine behaviour thus they have a degree of permanence, yet they are also continually changing and being renegotiated through interplay between human agency and social structures.

Institutions are thought to play a key role in the level of vulnerability and adaptive capacity within a social system because they shape the structure, allocation, availability and evolution of resource entitlements (Kelly and Adger 2000). Institutional policies play a major role in setting access to resources, establishing land-tenure and economic arrangements; allocating state funds; providing income generating opportunities; and controlling access to productive lands, water, credit, etc (Ribot 1995). Furthermore, institutional policies shape the

legal system of property rights and other economic conditions that have a significant effect on poverty and the processes of marginalization (Kelly and Adger 2000). They also connect local systems with outside society through the rules that shape the allocation of power, and the rights and entitlements to resources at different levels of decision-making (Williamson et al. 2007).

Institutions also provide the incentives, rules, mechanisms, tools, and means for motivating and directing adaptation (Williamson et al. 2007). These channels can include policies and regulations that determine the response to climate change or other environmental and societal pressures. Institutions also play a key role in the formation, development, and use of social networks and relationships that are important for a collective response to social challenges like climate change (Adger 2003).

The institutions of the state are generally considered to be dominant in determining access to resources, and most entitlements to material assets are legitimized by government and formal laws (Adger and Kelly 1999). Adger (1998) however, argues that the institutional determinants of vulnerability include the broader cultural context in which resource entitlements are socially differentiated. An examination of resource entitlements should thus extend beyond the institutions of the state to include both formal and informal political and cultural institutions.

## **2.5 *Institutional Theory***

The multi-disciplinary nature of vulnerability and adaptation research makes the integration of institutional analysis difficult. It also means that much



institutional research in the vulnerability and adaptive capacity discipline has failed to address issues related to institutional concepts or has disregarded the key debates of institutional theory (Pelling and High 2005).

Scott (2008) identifies the central building blocks of institutional structures, and argues that by focusing on these analytical elements institutionalists can overcome the epistemological and ontological debates that divide institutional analysis. Scott defines institutions as being “comprised of regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life” (p. 48). Scott argues that while one of these elements may dominate, robust institutional frameworks involve a combination of these elements, and suggests that they be viewed as providing, in interdependent and mutually reinforcing ways, a powerful social framework.

### **2.5.1 The Regulative Dimension**

The regulative pillar of Scott’s analytical framework explores the processes that standardize behaviour. Explicit regulatory processes, including rule-setting, monitoring, and sanctioning activities, are often the focus, but unwritten rules of conduct that motivate and enhance formal rules are also of importance (Scott 2008; North 1990). Scott argues that compliance with regulative rules is based on instrumentality and expediency, but that the primary mechanism of control is coercion. Thus mechanisms other than legitimate force or sanction are often used to induce compliance. Normative frameworks, monetary

incentives, or informal agreements have the affect of evoking feelings of fear, dread and guilt or relief, innocence, and vindication (Scott 2008). Scott also reminds us that

regulative rules will be interpreted; incentives and sanctions must be designed and will have unintended effects; surveillance mechanism are required but will prove to be fallible, not foolproof; and conformity is only one of many possible responses. (p. 54)

### **2.5.2 The Normative Dimension**

The normative pillar of Scott's framework focuses on systems of rules that provide the prescriptive, evaluative, and obligatory facets of society. These systems include values that represent what is favourable and aspired to, as well as norms that designate the appropriate ways to pursue those values. Scott remarks that some normative expectations apply to all members of society while others are applicable only to the actors that occupy given social roles. Normative institutional analysis therefore often examines the connections between particular institutional roles and the norms and values associated with those roles (Hall and Taylor 1996). Normative prescriptions of behaviour are upheld by other social actors and are thus experienced as external pressures; however actors are believed to internalize shared behaviour along with the values that these norms embody (Hall and Taylor 1996; Scott 2008). Scott argues that compliance with normative systems is induced through social obligation that evokes feelings of shame, disgrace and remorse or contrastingly, feelings of pride and honour. Normative

frameworks are thought to stem from moral roots that are often not formally codified (Pahl-Wostl 2009; Scott 2008).

### **2.5.3 The Cultural-Cognitive Dimension**

The cultural-cognitive pillar of Scott's analytical framework focuses on common conceptions of reality and shared frames of meaning. This type of institutional analysis explores the scripts that specify what behaviour is appropriate as well as possible (Hall and Taylor 1996). Scripts can include paradigms, mental models, and worldviews that encapsulate beliefs about what is realistic, legitimate, and preferred (Hay and Wincot 1998). Normative analysis thus examines prescriptive beliefs; while cognitive analysis explores the broader scripts that include values as well as a range of beliefs about the world. These scripts define the boundaries of problems and also establish the range of solutions that are possible as well as favoured (Pahl-Wostl et al. 2007).

Scott notes that compliance with the shared understanding and schema examined in the cultural-cognitive pillar of institutional analysis is thought to occur because alternative behaviours are inconceivable. Scripts or worldviews are taken for granted and affect feelings of certitude and confidence or confusion and disbelief.

Scott (2008) argues that early cognitive theorists insisted that knowledge frameworks are provided entirely by the social and cultural context into which a person is born. Much cognitive research thus used a calculative decision model that assumes people make choices in rational and analytical ways. This research has tended to treat affect and emotion as being outside the decision-making

process, and to emphasize the limitations or biases of individuals' cognitive abilities to process information and make decisions (Leiserowitz 2006; Scott 2008). While this perspective is still taken up by some modern-day theorists, Scott notes that there is growing support for a more active view of the role that humans play in acquiring knowledge. Specifically he describes the revision of the stimulus-response approach taken in cognitive theory to include an active organism that mediates between provocation and reaction.

## ***2.6 An Ideal Institutional Type for Adaptation***

An ideal type can be useful to compare with the institutional features observed in empirical settings in order to accentuate the elements that contribute both positively and negatively to adaptive capacity. Drawing on literature in the fields of common-pool resources and local decentralized governance, Agrawal (2008) provides a list of factors that promote better institutional performance for adaptation. Characteristics of institutions that will facilitate proactive adaptation include simple and easy to understand rules, fairness in resource allocation, clear enforcement mechanisms, clear and acceptable sanctioning mechanisms, available adjudication, and accountable decision-making. Institutions that have mechanisms to encourage and support cooperation and are inclusive to all parties, especially vulnerable groups, will contribute positively to adaptive capacity. Norms that promote collaboration, participation, and networked approaches to problem solving and governance are ideal and should become the dominant way of addressing community challenges and opportunities.

Institutions that support the integration of climate change matters into community governance are also crucial for the development of adaptive capacity. Furthermore, the positioning of climate change as a central consideration in community decision-making has the potential to support innovative adaptation. This undoubtedly requires that the belief that climate change must be addressed is institutionalized in governance. Aragwal argues that the integration of climate risks requires a greater role for local institutions in both planning and implementation. He suggests that adaptive development requires a willingness to experiment, the ability to take the risk of making mistakes, and flexibility that will facilitate social and institutional learning. This implies that local autonomy over community decision-making will be needed for adaptation to be successful. Therefore, governance that draws on local and regional human capital, particularly traditional ecological knowledge, to address climate change and other community challenges can build adaptive capacity. The allocation of financial resources to address climate change mitigation and adaptation at the community level will also support proactive adaptation.

Agrawal also notes that central governments can facilitate the functioning of local institutions and strengthen capacity by creating effective supports for local governance. They can provide information, financial resources, and skills development aimed at improving coping capacity at the local level. Additionally, they can improve institutional coordination between different levels of government and enhance access between government and social groups.

## **2.7 Empirical Research**

Institutional analysis in the climate change field has shown that institutions of all sorts can both enable and constrain response efforts (O’Riordan and Jordan 1999). It has identified and problematized normative and cognitive climate change frameworks in different institutional contexts, exploring the norms, scripts or frameworks that dominate governance responses to climate change and categorizing the values, beliefs and worldviews that are promoted within them. Normative climate change analysis however has predominately focused on the institutions of governance operating at a global scale. This research has also traditionally been focused on mitigation rather than adaptation likely because this has been the dominant focal point within governance.

Normative institutional research has documented the role of scientific and political institutions in the processes of knowledge creation, action instigation and policy design at a global level (Bernstein 2002, 2001; Jordan and O’Riordan 1995; O’Riordan and Jordan 1999). For example, claims about the existence of a global environmental crisis, in which statements about the catastrophic nature of climate change and its connection with global environmental change have been made within two distinct discourses popular within international institutions of environmental governance (Adger, Benjaminsen, Brown, and Svarstad 2001). Knowledge about global environmental change is said to have been created through international scientific studies and used to legitimate global action on the issue; specifically the stabilization and reduction of global GHG levels (O’Riordan and Jordan 1995). The allocation of reduction targets is argued to be

based on the belief that industrialized countries should lead mitigation efforts because they have historically been responsible for larger emission contributions, industrialized nations currently have much higher per capita emissions than non-industrialized countries, and they have more resources to remediate the problem (Harrison and McIntosh Sundstrom 2007; Moellendorf 2009). Moellendorf (2009) argues that the exemption of developing countries from binding targets exclude all but two mitigation options, both of which require rich industrialized countries to make very deep emission reductions. However this perspective does not necessarily match with the perspective of national governance or local-level management realities (Adger et al. 2001). The “liberal environmentalism” and market mechanisms espoused within global environmental discourse are also problematic for domestic policy response (Bernstein 2002, 2001).

As discussed in the cultural capital section above, some research has shown how normative and cultural factors play a role in individual behaviour and supports for policies to address climate change. For example, Leiserowitz (2006) surveyed Americans about their opinions on climate change and the effect that images associated with climate change brought to mind. He found that respondents had only moderate concerns about climate change overall but concern was primarily driven by perceptions of danger to geographically and temporally distant people and places. Policy preferences were found to be somewhat contradictory with the majority of respondents supporting national and international climate policies but opposing domestic policies that would increase the price of fossil-fuel based energy.

Support for national and international policies was strongly associated with egalitarian values while opposition was associated with individualistic and hierarchical values. Multiple regression analysis showed that affect, imagery, and values were stronger predictors of risk perceptions and support for policies to address global warming, than socio-demographic variables. The findings suggest that values and worldview strongly condition the way the public thinks about the risks of climate change and the policy options to address them, and can help to explain the paradox of moderate risk perceptions of climate change and its low priority relative to other concerns.

Institutional analysis in the vulnerability and adaptation field however has only occasionally examined the normative frameworks that exist within community governance institutions. Rarely are the beliefs, values or worldviews behind governance processes within a community examined to understand how a community responds to climate change, how “aggregate risks perceptions” and culture play a factor in community adaptive capacity, and how these frameworks structure the social dimensions of vulnerability and adaptation. Only a small segment of the research has sought to identify the cultural values and beliefs that are reflected in different institutions and has explored how they structure the governance of climate change.

Institutional analysis in the adaptation field has instead focused on the more regulative dimension of institutions. Although the historical focus of many formal institutional processes was on mitigation, adaptation is increasingly being integrated into mainstream policy and planning at multiple scales with the



growing realization that regardless of mitigation efforts, adaptation is now inevitable (Burton et al. 2002). According to a recent review of empirical research by Adger et al. (2007), adaptation addressed within formal governance has often been found to be integrated into existing sectoral management plans in areas like water, coastal security and disaster management through policy, infrastructure investments, technology, and behavioural changes. They surmise that adaptation is predominantly occurring as a reaction to current extreme events or is being integrated into more extensive projects rather than as a response to climate change alone.

One example of this comes from Tol, Klein, and Nicholls (2008) who show that within coastal defence there are few formal institutions in place to direct adaptation and those that do exist are in their infancy. Additionally, adaptation has yet to infiltrate some areas of regional governance deemed vulnerable to climate change such as forestry management in the Yukon (Ogden and Innes 2008). Adaptation has also been found to be occurring in an informal manner and subsequently reactive fashion without much integration into formal arenas such as resource management in the winter tourism industry (Scott and McBoyle 2007).

In place of formal rules and regulations that address adaptation, informal institutions often play an important role in how communities deal with climate extremes. Adger et al. (2007) provide several empirical examples including remittances through family and social networks, non-monetary arrangements such as food-sharing expectations and access to food, community organization, and a

sense of communal responsibility for recovery from hazards (Adger 2001; Barnett 2001; Ford, Smit, and Wandel 2006; Magdanz, Utermobile, and Wolfe 2002; Robledo, Fischler, and Patino 2004; Sutherland, Smit, Wulf, and Nakalevu 2005; Sygna 2005; Tompkins 2005).

Institutional research has nonetheless been successful at highlighting barriers to adaptation within formal and informal governance processes. Some of the common barriers identified include regulative, informational, cognitive, social, and cultural features (Adger et al. 2007). Institutional barriers that have been observed include difficulty making change particularly under conditions of uncertainty, (Tol, Van Der Grijp, Olsthoorn, and Van Der Werff 2003; Tol et al. 2006; Wittrock and Wheaton 2007) weak incentives for anticipatory responses to risk; weak communication between levels of government; local filtering of information (Naess, Bang, Eriksen, and Vevatne 2005), a lack of funding, knowledge, and skills specific to climate change (MacKendricks and Parkins 2004), minimal awareness of climate change among decision-makers, and a lack of coordination in response processes (Glantz 2001). Institutional arrangements may also act as impediments to the flow of knowledge (Adger et al. 2007), and a lack of credibility and effective cooperation between organizations can be substantial barriers to adaptation (Werners, Flachner, Matczak, Falaleeva, and Leemans 2009).

The documentation of these barriers may allow for the identification of ways to enhance and build adaptive capacity. Brown (2009), for example, shows that problem-solving capacity could be built through increased collaboration

between governance actors in the forest sector of Ontario. She argues that an expansion of stakeholder participation in inter-institutional networks, especially the importance of working with First Nations and forest-dependent communities, would enhance adaptive capacity by fostering the transfer, receipt and integration of knowledge between actors.

Overall, institutions that are more flexible, democratic and participatory are thought to enhance adaptive capacity and reduce vulnerability to climate change however there are few empirical examples that show the channels through which capacity is altered (Engle and Lemos 2010). Some exceptions include the following examples. Adger (2000) examined the structural changes that occurred for institutions that manage environmental risks and hazards as a result of the transition to a market-orientated economy in Vietnam. He found that structural changes diminished the collective efforts for improving flooding hazards and that increased local autonomy did not lead to greater local participation in decision-making, but rather led to increased vulnerability. He argues that vulnerability was exacerbated by institutional inertia and the fortification of commune power at the district and community level. The re-emergence of formal and informal institutions of the market and civil society did however offset some of these negative impacts. Adger concludes that it was formal institutions, those trying to retain their authority that had the greatest power in deciding the institutional characteristics of vulnerability.

These findings coincide with results from research that explored restructuring in public agricultural institutions in Mexico. Appendini (2001) found

that the reduction of access to publically-subsidized credit, insurance and technical assistance for small-scale farmers limited their ability to afford proposed adaptation measures (as reviewed in Adger et al. 2007).

The Food and Agriculture Organization of the United Nations (FAO 2006) examined the role of local institutions in reducing vulnerability to recurrent natural disasters and in developing sustainable livelihoods in the Philippines. The study found that institutional change reduced vulnerability and supported successful adaptation. The case study was carried out in the Iloilo Province where over half of the land is devoted to agriculture, but where frequent cyclones and typhoons cause floods, loss of life, and property destruction. The researchers found that the establishment of local governments with decentralized powers and increased decision-making abilities empowered local institutions and reduced vulnerability, while providing opportunities to apply localized solutions to problems posed by natural disasters. Increasing the role of local governments for on-site disaster management led to evolved coping mechanisms, more service availability, and cost effectiveness. An inclusive participatory institutional system developed informal social networks and provided mechanisms to take care of the most vulnerable households. Local institutions were also able to mediate successfully between local communities and national governments to develop policy changes that addressed locally relevant issues.

Similarly, Adger (2003) explored changing social relationships between the state and civil society in coastal resource management in Trinidad and Tobago. He found that positive learning relationships between government and

local stakeholders in the management of a protected marine area in Tobago were facilitated by governmental initiatives, conflict resolution, and a new institutional design. Specifically, the formation of social capital between community, formal-organizational, and national-regulatory institutions was characterized by networks of dependence and exchange which allowed them to adapt to and learn about new challenges (Tompkins, Adger, and Brown 2002). Inclusionary and integrated coastal management also contributed to adaptive capacity because the existence of networking social capital acted as a resource in coping with extremes in weather. Legitimate and proactive institutions were also able to promote the sustainable management of resources which in turn maintains the resilience of the social-ecological systems on which the population of Tobago depends.

Future challenges to address in institutional analysis include the incorporation of perceptions and governance research into mechanisms that can reduce vulnerability and promote adaptation and resilience (Adger 2006). There also needs to be more discussion within vulnerability and adaptation research on the processes that create an “enabling environment” for adaptation such as the processes of policy-making (Engle and Lemos 2010). The identification of necessary components of adaptation or system characteristics that are important to adaptation may also be able to highlight common sources of resilience across scales (Nelson et al. 2007). For example, sources of resilience may also include networks, social capital and the promotion of institutional learning and adaptive governance, while participation, democracy, equity and justice are argued to be

fundamental for development and the implementation of adaptation strategies (Eakin and Leurs 2006; Nelson et al. 2007; Smit and Pilifosova 2001).

### **2.7.1 Background – Impacts and Vulnerability in the Alberta context**

Climate change is predicted to impact the Prairie Provinces in a multitude of ways including severe warming and increased extreme climate events such as floods, droughts, and storms (Lemmen and Warren 2004). Projected climatic changes will vary spatially, however climate change scenarios imply that Alberta will experience an overall increase in annual mean temperatures, growing degree-days, and soil moisture index (which corresponds to a decrease in soil moisture), and a decrease in precipitation (Barrow and Yu 2005). Water scarcity is likely to be the most severe impact and research has shown that climate warming and human activities have already significantly reduced the flow of major western prairie rivers (Schindler and Donahue 2006). Climate change impacts on key natural resources are expected to have repercussions across the country and in virtually every sector of the economy, albeit in separate and distinctive ways (Lemmen and Warren 2004). The significance of these impacts to the Province of Alberta is uncertain. The Prairie Provinces show a higher overall ability to adapt but this ability varies across locations and populations (Sauchyn and Kulshreshtha 2007).

A recent social vulnerability report by Davidson, et al. (2008) explored how well Albertans are positioned to deal with the impacts of climate change.

Educational attainment, economic status and the proportion of working-age persons and families were factors that suggest that the province has high overall capacity to adapt. Alberta's economic wealth however comes from industries that are sensitive to climate change as well as fluctuations in the world market (Davidson et al. 2008). Increased vulnerability due to natural resource dependence can vary depending on the industry as well as the place, but the impacts of failing industries on livelihoods and well-being can be devastating (Stedman, Parkins, and Beckley 2004). Davidson et al. (2008) also identify the condition of the province's infrastructure and its ability to withstand climate-change-induced impacts as another potential source of vulnerability.

The report also reveals that Albertans are primarily in agreement about the existence of climate change. A 2007 survey by the researchers showed that 95% of participants believe the climate is changing. 78% of those that believe the climate is changing said that they do not believe climate change is caused by human activities. Only a small proportion of respondents were aware of the potential impacts to the province or individuals, and few felt personally responsible to address climate change. Consequently, most hadn't carried out any preparatory measures like installing backwater valves, buying extra home insurance, or developing reserve food and water supplies.

Similarly a study by Davidson, Wellstead, and Stedman (2004) found that policy members from a range of institutions do not agree about the importance of climate change. Results from the 2002 online survey of policy actors in the agricultural, forestry and water sectors of the Prairie Provinces show that the

majority of respondents (57.8%) agree that climate change is a problem. On the other hand, nearly a quarter of respondents (24.8%) thought that it is somewhat of a problem, and another substantial subset (17.4%) said that climate change was not a problem. The results also show that environmentalists and university researchers perceive climate change as posing a significantly higher risk than do industry or government actors. Interestingly, respondents had similar beliefs about the magnitude of climate change yet they drew different conclusions about the overall risks. Environmentalists and university scientists indicated having more ecologically-centered value orientations than those in industry or government, and these general worldviews were found to be more strongly related to perceived risk than more specific beliefs about the effects of climate change (Stedman 2004). The consistency between government and industry perspectives lead the researchers to suspect that government policy makers may be sympathetic to industry concerns and thus more likely than university researchers or environmentalists to take a conservative approach regarding climate change action. The researchers speculate that exposure to more information about climate change is not likely to change belief structures and that core beliefs would be expressed in policy. As industry and government actors make up the majority of policy-makers in the Prairie Provinces, policy may reflect these groups' value disposition toward the economic domain (Davidson et al. 2008).

Furthermore, Wellstead and Stedman (2007) report on the results of a 2003 online survey of individuals who influence policy in the agriculture, forestry and water sectors across Canada. They looked at respondents' involvement in



informal networks and their policy beliefs and found that many actors felt united with the federal government on future climate change action, but that most federal players did not share this perspective. The researchers suggest that this is problematic for climate change policy-making which requires collaboration and learning between a range of interested parties. Combined with the findings by Davidson et al. (2004) reviewed above, the indication is that there may be disagreement within governance on the importance of climate change policy and the appropriate approach to take. While the majority of governance managers believe that ecological changes due to climate change are either occurring or are likely to occur and that many of the potential impacts are of a serious or very serious nature, there may still be very few policies or programs in place to address the issue (Gauthier and Mcfee no date).

Given these findings, it is no surprise that there seems to be limited concern for adaptation within the Alberta Government. Davidson et al. (2008) found that there is indeed minimal adaptation planning occurring within provincial governance. The mitigation of GHGs was found to dominate policy discussions of climate change and provincial discourse was found to be centered on protecting economic interests against the costs of Kyoto compliance. The dominance of conservative views and tendency toward neoliberal downsizing within government led the researchers to conclude that the expansion of provincial responsibilities for mitigation and adaptation was unlikely without strong public insistence.

### **2.7.2 Vulnerability in Rural Prairie Communities**

In their vulnerability report, Davidson et al. (2008) identified several sub-populations within the province as being more vulnerable to the predicted impacts of climate change. These include the elderly, children, low-income families, recent immigrants, visible minorities, Aboriginal people, and families living in forestry-dependent, agriculturally-dependent and rural communities. The researchers explain that these populations have common sources of sensitivity such as physical susceptibility to potentially negative health effects in the case of children and the elderly, or dependence on the economic sectors most likely to be directly impacted by climate change, such as agriculture and forestry. While these groups face the same levels of exposure to the impacts of climate change, they generally don't have the resources needed to cope with the impacts (Kelly and Adger 2000). Additional sources of vulnerability listed include access to financial resources; access to social and institutional resources, and perceived salience of and personal responsibility for preparing for climate change impacts.

Rural communities in Alberta are generally considered to be more vulnerable than larger urban centres because they are often characterized by many of the factors that make specific populations vulnerable to climate change (Davidson et al. 2008). One of the important factors for rural communities is their elevated levels of economic dependence on natural resource industries and a lack of alternate opportunities which limit the possibility for economic diversification (Sauchyn and Kulshreshtha 2007). Resource dependent communities for example, may be unprepared for labour force changes that result from the impacts of climate change because of the limited human capital requirements of natural

resource sectors that can lead to underinvestment in higher educational attainment or overinvestment in specialized skill bases (Freudenburg 1992; Johnson and Stallman 1994; as referenced in Davidson et al. 2008).

The impacts of climate change on natural resource industries pose considerable problems for welfare in rural communities across Canada (Wall and Marzall 2006). Stedman et al. (2004) found that the effect of resource dependence on several indicators of well-being fluctuate in place and time. The effects of resource dependence on indicators of wellbeing are fairly positive for some industries like agriculture and more negative for other industries like fishing. This suggests that a place-based examination is important to get a better understanding of how natural resource dependence plays a role in vulnerability and adaptive capacity in Alberta's rural communities.

Another factor contributing to rural community vulnerability is isolation. Remote communities may become heavily dependent on one specialized industry or increasingly reliant on government involvement which can impinge upon local autonomy over economic development (Davidson et al. 2008). Isolated rural communities are also more likely to have limited emergency response capacity as well as restricted access to healthcare (Sauchyn and Kulshreshtha 2007).

A further feature for consideration is that many rural prairie communities are facing financial and attitudinal barriers that prevent long-term investments in much-needed infrastructure (Sauchyn and Kulshreshtha 2007). A 2002 study of six municipalities by the Federation of Canadian Municipalities showed that when it comes to infrastructure many climate change adaptation measures are outside

the current financial resources available to rural municipalities and that planning for future impacts is highly constrained. Participant feedback stated the need for financial commitments from the provincial government for infrastructure maintenance, which suggests that Alberta's rural communities require provincial engagement to plan for future impacts of climate change (Davidson et al. 2008).

Population trends may also contribute to rural vulnerability. Gauthier and McPhee (no date) report that rural communities in the prairies are increasingly being made up of vulnerable groups like the elderly, low income families, and Aboriginal people. They show that the proportion of youth in many rural communities is declining and the proportion of seniors is growing. The rising average age of residents is putting an increased strain on the working-age population because the tax base is shrinking and the tax burden per individual is growing. Gauthier and McPhee also show that there is substantial growth among Aboriginal peoples in the Prairie Provinces and that this population is younger than the non-aboriginal population. Market participation rates are more than 10 % lower for this population, unemployment rates are much higher and personal income is only 60% of the provincial average. Gauthier and McPhee argue that socio-economic trends have also been compounded by other factors such as increased economic pressures faced by rural residents now manifest in the increasing number of farmers employed in off-farm work, and in the increasing percentage of low-income families that make up rural communities in the Prairies.

The highly-stressed state in which rural communities currently find themselves suggests that the ability to handle the potential impacts of climate

change is poor (Canadian Senate Standing Committee on Agriculture and Forestry 2003). On the other hand, some research on the adaptive capacity of rural communities in Canada suggests that some communities may be in a relatively strong position in terms of their levels of social capital resources (Wall and Marzall 2006). Davidson et al. (2008), for example, report that in a recent survey Albertans showed a high degree of dedication to their communities, which implies that there are opportunities for participatory engagement in adaptation and potential support for planning initiatives (Davidson 2010).

Research that has examined the adaptive capacity of First Nations and Inuit communities has found that there is latent adaptive capacity existing within indigenous populations. A recent study of Arctic Bay in northern Canada by Ford et al. (2006) for example, shows that the Inuit are significantly adaptable, aided in part by traditional knowledge, strong social networks, flexibility in hunting cycles, the use of modern technologies, and economic support from federal and territorial governments. However, the researchers also note that changing livelihoods, specifically the transition to a more mixed economy made up of markets and traditional sectors, and more-permanent settlement, have undermined adaptive capacity and are contributing to new vulnerabilities.

First Nations Elders from Shoal Lake in Manitoba and James Smith in Saskatchewan similarly voiced concerns about the impacts that socio-cultural changes are having on the wellbeing of local people, particularly in regards to dependency and youth lifestyles (Ermine, Sauchyn, and Pittman 2008). Ermine et al. (2008) are hopeful however, that community philosophies, culture and

spirituality may facilitate local adaptive strategies in the future. The Prince Albert Grand Council Elders' Forum on Climate Change for instance, held in February 2004 brought together Elders and vulnerability researchers to discuss the impacts of climate change within their traditional territories. Ermine, Nilson, Sauchyn, Sauve, and Smith (2004) note that the observations of the Elders predominantly reinforced and added sentiment to scientific perspectives on climate change in Saskatchewan and broader western-scientific projections of future climate change. The Elders recognized the need for the revitalization of the relationship between people and the land in order to address climate change and other environmental issues and decided to put effort into strengthening their local communities and cultural connections to the land, particularly through working with the youth.

Research on historical adaptation to extreme weather and climatic changes also indicate that there is experience from which lessons can be drawn to facilitate adaptation efforts in Alberta. Wittrock and Wheaton (2007) for example, assessed adaptive responses in the agricultural industry to a coast-to-coast drought that occurred in Canada from 2001 to 2002. They documented the most frequently used options, their effectiveness, and spacing and timing features, related to success in reducing vulnerability. Numerous institutional barriers to adaptation were identified including limited organizational resources, a lack of funds and research, as well as limited climate change knowledge and skills within the sector (Wittrock and Wheaton 2007). Innovative examples were explored including research on and monitoring of drought, community support, communication, diversification and livestock management practices. The researchers conclude that

there is considerable room for improvement in drought adaptation and that more attention should be paid to adaptation research, planning, capacity building and the processes of implementation.

Empirical investigations of historical and current adaptation have also shown that there is much potential for positive institutional change. Machildon (2006) for example, examined the historical experience of institutional adaptation to drought in the Alberta Dry Belt over the period of 1909 to 1939. He found that the creation of the Special Areas Board (SAB) was a reaction to the perceived inadequacy of local municipalities and improvement districts to cope with the impacts of prolonged drought. Machildon established that the SAB had the size and expertise needed to facilitate adaptation and to reduce physical exposure to drought among farmer-ranchers and other residents in the area, and was therefore better positioned to help communities in the region adapt to drought than other types of governance organizations. The SAB and the Prairie Farm Rehabilitation Association remain some of the most significant governance actors in land and water management in the Prairies today (Machildon, Kulshreshtha, Wheaton, and Sauchyn 2007).

Research on adaptive response to the impacts of a Mountain Pine Beetle infestation in the provinces of British Columbia and Alberta has also shown the potential for positive institutional change. This work identified existing institutional limitations that intensify risk, and opportunities for the reduction of risk through institutional adaptation (Parkins and MacKendrick 2007). Parkins (2008) documents the emergence of meta-level governance arrangements in the

form of regional action coalitions that make decisions based on negotiation and collaboration. He suggests that these institutional innovations can act as foundations for further collective action.

## **2.8 *Summary***

Adaptation can generally be understood as a systemic change that increases the capacity to cope with climate change. The concept has been analyzed for multiple purposes including estimating the reduction of harm achieved from specific adaptive action, finding the best adaptation option among a bunch of alternatives, assessing the adaptive capacity of different groups, and understanding adaptation processes in order to facilitate practical action (Smit and Wandel 2006). This study was undertaken with the intention of understanding experiences with climate change and takes a bottom-up approach to look at the contextual factors at play in communities.

Vulnerability is an important concept in adaptation research. Fussel and Klein (2006) distinguish between the Adverse-Effects, Risk-Hazards, and Social-Constructivist models all of which conceptualize vulnerability in a distinct way and explore different analytical factors. The research described here uses the social-constructivist framework and focuses on the human dimension of vulnerability. Adaptive capacity is a component of vulnerability that refers to the ability to expand the coping range to existing and future climate stress (Brooks and Adger 2005). It encompasses the set of social, economic, natural, human and cultural resources available and the ability to use them effectively to address



climate change (Wall and Marzall 2006). Institutions, or the social rules that guide behaviour, will direct the way that resources are mobilized to address community challenges like climate change (Beckley et al. 2008). Institutional analysis is used as a tool to highlight the ways in which the regulative, normative, and cultural-cognitive dimensions of governance structure adaptive capacity (Scott 2008).

In brief, empirical institutional analysis in the vulnerability and adaptation fields has shown that institutions both enable and constrain society's response to climate change. Institutions have been shown to contribute to a community's vulnerability to climate change and its capacity to adapt although many of the mechanisms through which this occurs still need further exploration. Formal response processes and policy have generally remained focused on mitigation, while adaptation appears to be limited and reactive in many contexts. Nonetheless, adaptation is increasingly being integrated into governance policies and processes. Research has explored historical adaptation mechanisms to climate-related events and to new climatic challenges in order to highlight institutional barriers to effective adaptation, and to garner insight on the implications of social and institutional change for vulnerability and adaptation.

Normative analysis has been able to show how climate change discourses, processes, and policies prevalent in different contexts reflect specific beliefs about the issues and how to solve them. Research at the international level has documented the normative frameworks that are dominant in global processes of action and negotiations of climate change mitigation. This work has revealed that these frameworks narrow the range of possible responses, and has shown that

conceptualizations of the issues do not always fit with other perspectives, such as those operating at a national, regional, and on a smaller scale. Normative institutional analysis at the community-level has remained very limited and there is a need to incorporate this type of investigation into community-level examinations of vulnerability and adaptation.

In Alberta, indicators of rural community vulnerability include high levels of natural resource dependence and a lack of economic diversification, isolation and remoteness, financial and attitudinal barriers to investments and maintenance of infrastructure, and demographic trends resulting in increasing proportions of vulnerable populations (elderly, low income, and Aboriginal people), among others. All of these factors are also being felt by communities simultaneously which suggests that they may have limited ability to cope with the impacts of climate change. However strong social capital, latent adaptive capacity among some groups, and previous experience with adaptation to climatic change suggest that rural communities in Alberta may have resources at their disposal that can contribute positively to their adaptive capacity. The capacity to adapt is context-dependent and this implies that a place-based contextual investigation of communities' capacity is needed in order to gain more understanding of the role that institutions play in rural communities.

This paper now further examines adaptive capacity in a study of two rural communities in Alberta that are subject to the same broad rules operating within the same overall governance context (i.e., a provincial milieu with a “western culture” in a developed country with indications of high but variable adaptive

capacity). It explores the institutions of governance operating within each as well as the larger governance situation in which they are embedded, to gain insight into the role of institutions in shaping the adaptive capacity of communities. Particular attention is paid to the cultural frameworks of governance operating in each community and the implications of this institutional dimension for adaptive capacity.

The research questions of this study are; 1) what are the regulative, normative, and cultural-cognitive governance contexts in these two rural communities 2) what are the symbolic systems, cognitive scripts, and moral templates that structure local governance 3) how do governance institutions structure understanding of climate change within the community and influence decision-making about the appropriate ways to address the impacts of climate change 4) what kind of repercussions do governance institutions have for adaptive capacity?

### **3 Study Methodology**

#### ***3.1 Method***

The study used a comparative case study approach, which was chosen because it allows the complexities of location-specific phenomena to emerge while also allowing commonalities between places to come forward. Compared with other approaches, a case study can contribute to more in-depth knowledge of institutional processes and the implications of these processes. In other words, a case study method is suitable in explaining the how and why of phenomena (Yin

2003). Comparative case studies can also facilitate theory-building despite the difficulty of generalization (Wilbanks and Kates 1999). Rather than being able to generalize findings to a population, case studies can be considered generalizable to theoretical propositions and the goal should be to expand and generalize theories (Yin 2003).

### **3.1.1 Scale**

An important consideration for the choice of method in institutional analysis is scale (Beckley et al. 2008). The impacts of climate change, sensitivities to those impacts and socio-economic conditions affecting adaptive capacity have been shown to differ significantly across scales (O'Brien et al. 2004). The diversity of impacts and the range of cultural settings indicate that adaptation responses will often be multi-level processes (Ostrom, Burger, Field, Norgaard, and Polincansky 1999). Scale is an important consideration because institutional adaptations to the impacts of climate change are also likely to occur at various levels as will the implementation of different planning strategies (Mendis, Mills, and Yantz 2003). Climate change studies should thus pay attention to processes operating at several scales (Wilbanks 2002).

The scale chosen for this research is the community level; however the institutional processes occurring at other levels of governance, particularly at the provincial level, were taken into consideration. A comparison between communities operating within the same high-level structures highlights interactions between governance institutions in a particular location as well as distinguishing the constraints and freedoms of these structures.

### 3.1.2 Community Selection

The two communities chosen for the comparative case study were Canmore and High Level, because they were anticipated to have very different sensitivities to the impacts of climate change, in addition to diverse adaptive capacities. Several indicators of vulnerability suggest that High Level would be more vulnerable to the impacts of climate change than Canmore (Table 1). These indicators include population, proximity to a major urban centre, resource dependence, education, and income (further reviewed in Chapter 4).

**Table 1 Vulnerability Indicators for Canmore and High Level**

<b>Vulnerability Indicator</b>	<b>Canmore</b>	<b>High Level</b>
Proximity to major urban centre	100 kms	780 kms
Population	12,039	3887
Aboriginal Population	1.5%	21.8%
Economy	Tourism	Forestry, Oil and Gas, Agriculture
University Education	30.4%	11.5%
Mean Income	\$30,512	\$34,398

### 3.2 Data Collection

The collection of data for the case studies was carried out using a framework developed by Diaz and Rojas (2006) developed to assess governance institutions that manage water resources. This process is easily applicable to other types of governance institutions and allows the main components of these institutions to be identified. They look at the following four dimensions of

institutions: organizations, instruments, management, and decision-making and values.

The first step was to identify the institutional arrangements of community governance inclusive of organizations, their formal roles and responsibilities, and the linkages between organizations (Diaz and Rojas 2006). Secondary data collection was used to identify the organizations that play a role in community governance including various departments of municipal governments, environmental organizations, economic and community development agencies, local businesses and several others. Specifically, these organizations were identified using the internet and by visiting government and community WebPages, as well as by contacting community organizations and consulting community directories. A similar procedure was followed to identify the higher-level provincial organizations that will play an important role in adaptation to climate change in rural communities.

Once a list of governance organizations was compiled for each community and the province more broadly, a purposeful sampling approach was used to select participants for interviewing. Based on the different climate change risks facing the province of Alberta, those organizations that are expected to see the most direct impacts were prioritized and organizations were chosen from the top of the list downward. Executives from these organizations were asked to participate, with a focus on people in management positions, as these individuals are likely to have a better understanding of the various constraints faced by their organization.

Interviews were conducted and participants were asked to discuss themselves and their community, climate change, organizational efficacy, and organizational relationships (Diaz and Rojas 2006). A multitude of policy and planning documents were also collected from online sources including government websites or directly from organizations and participants for further analysis. Supplementary data was gathered from the Statistics Canada website for the 2006 Census as well as from community and organizational websites.

The interviews were tape recorded and notes about the respondent's dialogue, as well as their characteristics, enthusiasm, body language, and overall mood were taken by the interviewer during the interview process. Reliability was ensured during the interview by getting respondents to clarify a response that was vague as well as through the use of prompts to get respondents to talk more about a particular issue. Summarizing or repeating back an interpretation of the answer was also used to ensure that the interviewer understood the respondent's perspective. The taped interviews were then transcribed verbatim into an electronic format, along with the interviewer's notes for analysis.

### **3.3 *Instrument***

Semi-structured interviews are useful when the researcher knows enough about the topic to develop questions in advance but not enough to anticipate the answers (Richards and Morse 2007). The development of interview questions was based on a review of relevant literature. An interview guide was developed with predetermined questions that were modified as appropriate for each interview (see

Appendix A). The goal was to solicit detailed, complex answers thus probes were used and cues were taken to obtain in-depth discussion of the topics.

The interview covered four subject areas: respondents and their community (or rural communities more generally), climate change, organizational efficacy, and organizational relationships. First respondents were asked to describe their community. What makes it a nice place to live or what is unique about it? Is there a strong sense of cohesion? They were also asked how long they had been working for the organization in their current position.

Respondents were asked to describe the big issues of concern for community residents. If respondents did not mention climate change, they were then asked directly if they thought it was a concern for the community.

Respondents were asked to describe what they knew about climate change and how they thought it might affect the community. It is worth noting that the interview participants from higher-level provincial organizations rather than a community-based organization answered a variation of the questions in this section. First of all they were not asked to describe their community but rather to discuss the major issues of concern for rural communities across the province and to assess generally if rural communities were concerned about climate change. Secondly they were asked to describe their knowledge of potential climate change impacts on the province more broadly.

All respondents were questioned about whether climate change was a topic of interest for their organization and whether there was any disagreement within their organization about climate change issues. Respondents were also



asked if the organization had taken any action as a result of climate change concerns.

Next respondents were asked about organizational efficacy. This included questions about the organization's mission and the ability to evaluate its own performance in achieving that mission. Follow-up questions centered on the organization's ability to change course given poor performance or to learn from challenging experiences. Respondents were asked about their information sources and whether this included sources outside of the organization. They were also asked to discuss the internal and external constraints on their organization's efficacy including questions about their organization's decision-making autonomy and its ability to provide input into community and higher-level decision-making.

Finally, respondents were asked to describe the public sector setting and regulatory framework within which their organization functions. This description included answers about the networks that their organization operates within and about the relationships between their organization and others. It also included questions about organizational coordination and the ability of different organizations to work together on community issues or towards common goals. The last two questions asked respondents about who they thought should bear the most responsibility for climate change adaptation and to assess the ability of these organizations to ensure effective adaptation.

### **3.4 Data Analysis**

The secondary data and the interview transcripts were analyzed using NVivo; textual-data-coding software. The analysis involved first identifying regulative policies and processes, normative discourses about climate change, and cultural-cognitive beliefs, concerns, priorities, and worldviews. This was accomplished by reading the texts in both a literal and an interpretive manner. The literal reading allowed explicitly stated topics to be identified and coded. The interpretive reading, on the other hand, allowed implicitly held beliefs and values to be identified.

Next the data was broken down into discrete parts, closely examined and contrasted for similarities and differences using open coding (Strauss and Corbin 1990). These open categories were then examined individually and connections between categories were identified. This process is known as axial coding (Strauss and Corbin 1990). Finally core categories were selected. The dominant themes were identified by determining which appeared more often in the texts and which were more commonly identified by participants.

A variety of regulative, normative and cognitive themes were identified in the coding process, however only a few were dominant. Glaser and Strauss (1967) note the importance of constant comparison of how items are similar and different to other items, or to themselves at other times or settings. This comparison showed that several of the dominant themes apply to both communities and some were supported in discussion of rural communities across the province. Other themes were found to be more unique to one community. Finally the analysis

involved determining the effects that these institutional dimensions had on community governance and adaptive capacity.

Validity and reliability were maintained in several ways. Triangulation was used to ensure verification of data and themes. Specifically, interview data was checked against secondary sources of data including websites, documents, and literature. Member checks were made during the interviews by summarizing the answers to questions and allowing respondents to rectify any confusion or miscommunication. Rich, thick descriptions were used to describe findings so that other researchers can determine generalizability to other contexts (Merriam 1998).

### **3.5 *Limitations***

One of the limitations of this study is that only a small number of people were interviewed which restricted the number of different experiences and knowledge that could be accessed. For example, only two representatives from one First Nations organization were able to be interviewed in High Level. Given the time allowance of a Masters' thesis, having a larger number of interviews would have had to have been traded for less in-depth discussion, and this would not necessarily have provided more useful information. As institutional capacity is very much influenced by the local situation, more in-depth interviews that explore the many facets of the local context will provide better insight into the various factors that influence and shape this phenomenon

## **4 Findings**

### ***4.1 Interview participants***

A total of thirty-two interviews were conducted and two interviews included two participants that were interviewed simultaneously; therefore the total number of participants was thirty four (see Table 2 below). Altogether there were twelve participants from High Level, thirteen from Canmore, and eight were provincial participants. Thirteen of these participants were female and twenty one were male. These interview participants also represented a vast array of organizations; two were employed in industry, five with the provincial government, twelve with municipal governments, twelve with non-government organizations (NGOs), and three with Aboriginal organizations. Three out of thirty four interviewees were elected officials.

Eleven interviews were conducted in High Level, one of which was a double interview with two male participants from an Aboriginal organization, making twelve the total number of interview participants from High Level. Five of the interview participants were female and seven were male. One participant was from industry; one was employed by the provincial government, two worked for non-government organizations, three worked for Aboriginal organizations (one First Nations and one Métis organization) and five participants were from municipal government. Two of the five participants from municipal government were elected officials.

Thirteen interviews were conducted in Canmore with thirteen participants, six of which were with female participants and seven with male participants.

Seven participants were employed in municipal government and one of these was an elected official, and six participants worked for NGOs.

Eight interviews were carried out with representatives from organizations operating within provincial-level governance; one of which was a double interview with two men from the provincial government. In total nine provincial level participants were interviewed, two of which were female and seven male. One participant was from industry, four were from provincial government and four worked for NGOs. None were elected officials.

**Table 2 Sample Characteristics**

Community	Total Interviews (Participants)	Gender	Employment	Elected Officials
High Level	11 (12)	Female – 5 Male – 6 (7)	Industry – 1 Provincial Government -1 Municipal Government – 5 NGO – 2 Aboriginal Organization – 2 (3)	2
Canmore	13	Female – 6 Male – 7	Municipal Government – 7 NGO – 6	1
Provincial	8 (9)	Female – 2 Male – 6 (7)	Industry – 1 Provincial Government – 3 (4) NGO – 4	0
Total	32 (34)	Female – 13 Male – 19 (21)	Industry – 2 Provincial Government – 3 (4) Municipal Government - 12 NGO – 13 Aboriginal Organization – 2 (3)	3

## **4.2 *Communities***

### **4.2.1 Canmore**

#### **4.2.1.1 Demographics**

The town of Canmore has a population of 12,005 permanent and 5,567 non-permanent residents, for a combined total population of 17,572 (Biosphere Institute of the Bow Valley 2008). Geographically, Canmore is located approximately 100 kilometres from the City of Calgary, situated in the Rocky Mountains, close to provincial and national parks. Participants described the community as a national and international destination for visitors. The recreational opportunities and the natural beauty of the local environment attract visitors mostly from other parts of the province as well as from other provinces and countries (McNicol and Buxton 2006).

The economy in Canmore is primarily based on tourism and different service sectors. There are also many vacation and second-homes located in the community. The Accommodation and Food sector employed 16% of the local work force in 2008 and the Construction Industry employed an additional 15% (Biosphere Institute of the Bow Valley 2008). Other relatively important sectors were Personal Services (12%), Education, Health, and Social Services (12%), and Retail (8.5%) (Town of Canmore 2008).

According to Statistics Canada (2006) educational attainment in Canmore is high with 63.5% of the population 15 years and over having at least an apprenticeship or college certificate. 30.4% of the population have a university

certificate, diploma or degree which is considerably higher than the overall percentage of Albertans with a university education (21.5%). The mean individual income for Canmore was \$30,512 in 2006 compared to a mean of \$28,896 for Alberta. The median income for all census families in Canmore the same year was \$69,020; considerably higher than the provincial median of \$63,988.

#### **4.2.1.2 Governance Challenge: Growth of the Non-Permanent Population and the Effect on Cost of Living**

Three participants referred to the rate of growth when describing Canmore, four identified growth as one of the main community concerns and six participants referred to growth when discussing particular community issues. Additionally a provincial representative referred to population growth in Canmore when discussing relationships with rural communities. In total, ten out of thirteen participants from Canmore discussed growth as one of the challenges facing the community.

Overall, the population of Canmore grew 11.6% from 2001 to 2006 however this is only reflective of permanent residents (Statistics Canada 2006). The 2008 Community Census shows that Canmore's permanent population grew 3.5% in one year (2007) while the non-permanent population grew by 15.5%. It also mentions that the rate of growth for the non-permanent population has increased over time. In 2008, the percentage of non-permanent residents as a proportion of the total population in Canmore was up to 31.7% (Town of Canmore 2008).

Six participants identified high living costs as one of the challenges for community governance and many related this back to non-permanent residents. One participant explained that the high cost of living in Canmore is a result of the price of housing;

“the cost of living in Canmore, if you excluded housing, is about the same as everywhere else ... food and gas, and all that stuff is relatively comparable but the housing is exorbitant so it raises our cost of living significantly” (Municipal Government, Canmore, September 2008)

A 2007 Alberta price-to-place comparison shows that the price of shelter in Canmore was the second highest of all communities compared, just slightly less expensive than Fort McMurray (Alberta Finance and Statistics 2008). The average value of an owned home in Canmore was \$522,646 in 2006; approximately \$228,835 above the average value of a home in Alberta (Statistics Canada 2006). By 2008, the average price peaked at over \$640,000 (Biosphere Institute of the Bow Valley 2008). Rental rates have also increased. The monthly average rental price was over \$1500 for a two bedroom home in 2007, an increase of 65% since 2002 (Biosphere Institute of the Bow Valley 2008).

The cost of living [is a concern]; you have to be able to afford to live here, and to be able to buy and/or rent here. And that's a big one, that's huge. I mean if you come here because you think you'll be able to stay and survive, you really have to look at your finances quite seriously. (Municipal Government, Canmore, September 2008)

#### **4.2.1.3 The Retention of Community Residents**

Three participants said that the rising cost of housing was a factor causing many young families and low-income groups to leave the community. Some of these participants also associated this change in demographics with the increasing



presence of non-permanent residents.

“We’re losing children and families out of our community... the ones that come occasionally want everything [to stay] just the way it is. They don’t want anything changing and they don’t recognize what it’s doing to our community ... a lot of them frankly just don’t care that our kids and grandkids are being forced out of our community ... most of the seniors can’t afford to live here [either], their property taxes are just enormous.” (ENGO, Canmore, September 2008)

The 2008 Community Monitoring Report confirmed that there was a declining number of children and youth in the community, and as a result the local schools had low enrolment. The report additionally showed that, despite the sky-rocketing cost of housing, increases in the level of social assistance were small while demand for food assistance had remained steady. Furthermore, the report revealed the fact that the gap between incomes and housing costs has widened to the point that the average price of a home in Canmore was unattainable for those earning the average family income.

Three participants mentioned that these changing demographics had become a consideration in community development and decision-making;

“There’s all kinds of ideas around how to sustain [the permanent population]. Some of them include saying to the developers “you can’t build any more condos to bring non-permanent residents here”. Those are big tough decisions that the Town Council is struggling with. Plus there’s a downturn in the economy so the developers are actually asking themselves “how long will we be able to build these condos and vacation homes, and have people from Edmonton and Calgary purchase them?” (Municipal Government, Canmore, September 2008)

I think one of the big issues is the changing demographics ... If we’re losing families and getting all these weekenders, is that a change we want? Do we want to watch this happen or do we want to provide top-of-the-line schools, top-of-the-line recreation that can attract families? That is an issue that we struggle with. Are we going to default and just let whatever happens happen? (ENGO, Canmore, September 2008)

Since the 1990s, several committees, studies and initiatives have been undertaken to address housing issues in Canmore (Town of Canmore 2003). In 2001, the Town of Canmore established an arm's length non-profit corporation in order to address affordable housing issues in the community (Town of Canmore 2009a). The Canmore Community Housing Corporation is tasked with the development of perpetually affordable housing and in 2008 they identified a range of housing policies and actions to address housing needs. The Comprehensive Housing Action Plan lays out action items and potential policies based on the principal of shared community responsibility (Town of Canmore 2008b).

#### **4.2.1.4 Sustainability Discourse**

Community governance in Canmore is characterized by the dominance of a sustainability paradigm. Ten out of thirteen interview participants from Canmore spoke about sustainability and seventeen of the documents collected from community organizations discussed sustainability. Most of this dialogue centres on the appropriate ways to govern community development and growth given the values and vision of Canmore's citizens.

The Biosphere Institute, an environmental organization that works closely with the Town of Canmore, brought forward the Natural Step program in 2004. The Town of Canmore, along with several other local organizations, has officially committed to this process. The Natural Step program involves an ambitious education, visioning and planning process to help communities like Canmore

become sustainable and balance increasing demand for natural resources with decreasing availability (Town of Canmore 2004). It is meant to be a tool that can help with the strategic integration of sustainability into planning and decision-making.

As a part of the Natural Step program, the Town began the “Mining the Future” process in 2005. Over 600 individuals and organizational representatives took part in multiple rounds of discussion about the forces affecting the community’s future, the development of future scenarios, the identification of community values and goals, and the development of a vision for the community. Many community organizations continue to be engaged in sustainability planning and community-wide initiatives related to sustainability.

From the Mining the Future process, three community values were identified; sustainability or the integration of social, economic and environmental activities, diversity of the people, perspectives and lifestyles within the community, and a connected and shared sense of belonging among all citizens.

The vision for the town can be summarized as:

“An accessible, friendly, inclusive and closely-knit community ... populated by a wide range of individuals and families ... that supports its population with affordable housing, a strong and varied economy, a healthy environment, a full array of social services, abundant open space and ample opportunities for recreation and artistic expression. A community that acknowledges and works within the limits imposed by its geography and ecology, ... and that uses [a world-class] ... built environment that respects and is worthy of its natural environment; a leader in integrating its social, economic and environmental activities in ways that ensure its future generations will enjoy the same opportunities and quality of life as its current generations.” (Mining the Future 2005)

In addition to these values and vision, guiding principles, goals and decision-making criteria were also developed to aid implementation.

After the completion of the Mining the Future process, there have been efforts made to integrate these values and vision into existing policies that guide town planning. For example, the municipality has been working toward converting its 1998 Municipal Development Plan (MDP) to a Community Sustainability Plan (CSP) since 2007. According to the Town of Canmore website (Town of Canmore 2010), a draft document was presented to Council in 2008 after extensive community input in group meetings and world cafes. A series of public open houses and two public hearings were then held in late 2008 and 2009. The Town Council had two readings of the updated draft in 2009; however they decided to rescind the plan for several reasons. First, a local development project controlled by an American company has gone into receivership and the creditors have several concerns with the proposed CSP that remain unresolved. Additionally, the Town website says that the provincial government is exploring two issues that would affect the CSP and that this is relevant because the CSP will have to comply with provincial decisions. Firstly the province is exploring a wildlife corridor issue that would affect the CSP. Secondly the newly passed Alberta Land Stewardship Act requires compulsory regional and sub-regional plans with which the CSP will need to conform. The Town of Canmore has stated that the uncertainty and complexity introduced by these outside processes make the finalization of the CSP complicated and so Council has rescinded the new CSP and the old MDP will remain in effect until some or all of these issues have

been clarified, at which point the CSP could be reconsidered (Town of Canmore 2010).

The values identified in the Mining the Future process have also been used to create several new programs, processes and policies. One of the new policies developed under the “Natural Step” program is the Sustainability Screening Report. This process requires developers to detail the net environmental, social, and economic benefits of proposed projects to the Town Council. The Sustainability Screening process was officially adopted by Council in 2007 and provides the opportunity for public and the Council to consider the benefits of a proposed development before it begins.

Only two participants discussed the Sustainability Screening process but both considered it to be a unique and innovative process. Both participants also said that they felt proud of this initiative.

We have a process called the Sustainability Screening Process that’s unique to Canmore. ... Before they can apply for a development permit, they have to give a report to Council, and it’s a public report. So the public is invited to come and listen and participate and ask questions and make comments. And they have to explain the net benefit of their development to the community. ... I have great swells of civic pride in those. It’s really been an amazing process. ... we’re doing a good job around ... effort and asking hard questions. (Municipal Government, Canmore, September 2008)

As a result of this process, the Town of Canmore has seen several economic, environmental and social benefits including the donation of more than \$1 million to the affordable housing fund by the development industry, \$100,000 contributed to a local daycare, and an additional \$350,000 for Canmore Community Coop Workshop and Gallery to name but a few (Alberta Municipal Affairs 2009b).

Several other new programs and policies have evolved from the “Natural Step Framework” and the “Mining the Future” processes. These include the Bow Valley Sustainability Hub which provides information and seminars about sustainability initiatives in the region and an internal Town of Canmore sustainability training program (Biosphere Institute of the Bow Valley 2009). Additionally several other strategic and planning documents have been or are under development including the Sustainable Economic Development and Tourism Strategy and projects like WildSmart which aims to reduce negative interactions between humans and wildlife.

#### **4.2.1.5 Social Capital**

The 2008 Sense of Community Report (n = 1603, 68% permanent residents, 29% non-permanent residents and 2% seasonal residents), commissioned by the Town of Canmore, found that the majority of respondents (70%) completely or somewhat agreed that there is a strong sense of community in Canmore (Town of Canmore 2008c). The majority of respondents also said that they like living in Canmore (93%), that they feel like they belong in the community (86%) and that it would take a lot for them to move away (78%). A smaller majority also said that they attend community events and activities (83%), and that they have been involved with volunteer activities (59%). By and large, responses from permanent and non-permanent residents were similar however a larger majority of non-permanent residents agreed that there was a strong sense of community in Canmore (78% and 67%) while a larger majority of permanent

residents said that they volunteer in the community (69% and 23%) (Town of Canmore 2008c).

The 2008 Community Monitoring Report showed that voter participation in Canmore is lower than the average for other jurisdictions in three recent elections. Specifically, the report showed that 24.6% of eligible voters in Canmore participated in the 2007 Municipal Election in contrast to the percentage of Albertans that cast a ballot in municipal elections across the province (31.6%). 32.3% of eligible voters in Canmore turned out for the 2008 Provincial Election in comparison with 40.6% of Albertans. Finally, 60.5% of voters in Canmore participated in the 2008 federal election, just below the rate of eligible voters that turned out in Alberta (61.9%) and across Canada (64.7%).

Overall, the majority of participants thought that relationships between various organizations within the community were positive. They identified several projects that were conducted in a collaborative and consensus-based fashion. For example, the “Mining the Future” process engaged a wide array of organizations and community members in the creation of a vision for the town. Part of that vision is to increase the involvement of the community in decision-making by providing opportunities outside the official public hearing process. As a result, the Town of Canmore adopted an Engagement and Information Policy in 2007 that lays out how the decision-making process ought to proceed including details around when and how consultation and collaboration should occur. The development of the Community Sustainability Plan and the Community

Monitoring Program are other examples of civic engagement that have allowed the public to be involved in community decision-making.

“There’s about 30 fairly high-level environmental conservation groups that do work with Council and do provide advice and consultation to us.” (Municipal Government, Canmore, September 2008)

“[this department] is all about building skills, connecting people, networking, providing information, supports, education ... [relationships between organizations are] really good [however] we have to work on them constantly ... we are constantly connecting, reconnecting, re-establishing networks. ... You can’t work in social work or social services in a small community without all that kind of collaboration and cooperation. That’s how we help families. (Municipal Government, Canmore, September 2008)

While participants acknowledged these processes and said that relationships between organizations were mostly positive, they also said that there are challenges in terms of how different organizations work together. These challenges mostly have to do with the way that different organizations look at a particular subject or differences in organizational priorities.

Sometimes there may be ... challenges in terms of what everyone thinks is the right thing to do and where we should best put our energy. I don’t think that anyone doubts that we should be doing everything that we can however ... we just have to be really strategic about picking the things that we want to do ... so I would say that most of our engagements or anything that we’ve partnered with other organizations [on] have ultimately ended up being very rewarding in the end but sometimes they can be a little bit bumpy in the beginning, mostly because of trying to figure out how the best way to get something done is. (NGO, Canmore, October 2008)

These challenges also emerged when participants discussed vertical relationships between local institutional actors in Canmore and those in higher-level government. For instance, a few interviewees (three) said that decisions



made at a local level to address community challenges were sometimes limited by provincial decision-making.

We've actually been challenged by the provincial government that (the Sustainability Screening Report) may not be in the best interest of ... basically moving development along. So we've had to be a little bit cautious in how we ... implement this particular review because it's a non-statutory review. We feel that we have a broad base of support in the community ... we feel quite proud of it, it's innovative, it's creative, a lot of communities are looking to Canmore for guidance in how this is actually implemented and now we're being told by the province that because it's not statutory we may be overstepping our bounds in requiring developers to prove that their development is sustainable. (Municipal Government, Canmore, September 2008)

In Canmore, four participants said that they have direct access to provincial-level decision-makers and two said that they have indirect access through their organization's participation in municipal associations. Five interviewees however, questioned their actual influence on decision-making by the provincial government.

"We were invited to an analysis of the Alberta Water for Life Strategy and its potential success and also the Groundwater Action Plan for the province so we have been involved directly in public policy inputs from outside experts to help guide the province toward the direction they should go. So we are working in those domains. How effectively anybody is doing it in this province is another story, but at least we are voice and we are often consulted" (NGO, Canmore, November 2008)

#### **4.2.1.6 Environmental Concerns**

In Canmore, the impact that human behaviour has on the environment is an important consideration for governance. Interview participants consistently identified environmental concerns as paramount for citizens and community organizations. Twelve out of thirteen participants from Canmore discussed

environmental concerns overall and several made specific reference to concerns about water (eight), wildlife (eight), waste (four), and emissions (four). Twenty two secondary documents collected from organizations in the community also discussed environmental issues in Canmore and the greater region.

The attitude taken towards the environment can be characterized by what Gagnon-Thompson and Barton (1994) call an ecocentric value orientation. This is when individuals value nature for its own sake and consider environmental protection important because of its intrinsic value. Gagnon-Thompson and Barton (1994; p. 150) also state that ecocentrics are likely to stress a connectedness between humans and non-human nature “that transcends the ability of natural resources to satisfy human material or physical wants.” Several participant comments suggest that there is a belief that non-human species have rights to a “natural environment.” For example, eight participants discussed concerns about wildlife and the desire to prevent negative human interaction;

“Particularly around wildlife ... wildlife corridors [and the] ability for wildlife to move through the community without running into people and having conflict. There is concern about wildlife crossing the road, crossing the railroad tracks and getting into neighborhoods.” (Municipal government, Canmore, September 2008)

“Protecting and conserving wildlife corridors to keep them as natural as possible.” (NGO, Canmore, October 2008)

Secondary documents appear to reflect this value-orientation as well. The Mining the Future (2005) Executive Summary, for example, summarizes the community vision, as decided by citizens, which states that there needs to be limits to the impact the community has on its environment. This document

identifies environmental stewardship as a principle that should guide community operations in the following manner:

“The fact that Canmore is geographically bounded and that it shares the area with other species means that there are physical realities to the community. This component [environmental stewardship] is about resilience (ecosystem health) in terms of ecological integrity, and resilience in terms of the changing relationship that the community has with it as it moves into the future. It requires the demonstration of individual and community responsibility towards the natural environment.” (Mining the Future 2005, p. 20)

The community vision also discusses the need to consider the community’s carrying capacity, the size of its’ environmental footprint, and the accommodation of wildlife in land use decision-making (Mining the Future 2005, p. 16).

According to the Town of Canmore (2009b) website, this vision is based on the belief that the community has “a singular relationship with its surroundings” and that “environmental sustainability and economic sustainability can be reconciled”.

There are over 30 environmental organizations active in community governance in Canmore. These groups work on topics like water, ecological integrity and climate change. They offer input into the decision-making processes, provide education and raise awareness of various environmental issues, and develop projects to reduce individual, business and community footprints. The Town of Canmore has also introduced several environmental programs and the environment has become an important consideration in their decision-making. For example, an interviewee from the Town Council said;

“We elected to do some more environmentally sensitive approach to the treatment of ground water on that particular street which drew the ire of all the residents cause they wanted full on asphalt the full width of the roadway and we wanted to deal with the groundwater runoff in a more environmentally progressive and sensitive manner. So we went and met

with the citizens and ... listened to their side of the story and found out, from Administration, why new processes and approaches were being used and made a decision to support Administration's move on that even though locally it was pretty decisive and contentious. So we felt that we erred on the side of what was right for the environment as opposed to perhaps a convenience or an aesthetics perspective or a "just the way it's been done for 50 years" perspective of the citizenry." (Canmore, September 2008)

One of the more significant environmental programs introduced by the Town of Canmore is the Environmental Care Program, which attempts to involve the community in water, energy, waste, pesticide, and snow management initiatives. The implementation of these initiatives follows a five-milestone model that includes; 1) the establishment of baseline data, 2) the establishment of a goal, 3) the development of a plan to achieve that goal, 4) the implementation of the plan, and 5) monitoring of success (Town of Canmore 2009a). The accomplishment of each stage is reported on the Town's website and in bi-annual progress reports carried out through the Canmore Community Monitoring Program (Biosphere Institute 2009). There are a myriad of other environmental initiatives occurring in Canmore including the Bow Valley Transit Initiative to expand and upgrade existing transit and improve the regional transit system, the Alberta Solar Showcase, and projects like Sustainable Action Canmore which gets citizens to make personal commitments to sustainability by reducing their environmental footprint.

While some of these initiatives have achieved results, several indicators suggest there is room for improvement; particularly around the mechanisms used to achieve compliance with environmental goals. The 2008 Community Monitoring Report, for example, states that many of the target goals set for the

Environmental Care Programs apply only to the permanent population, and should be expanded to include the non-permanent group as this reflects approximately one third of Canmore's population and subsequently a large part of the community's environmental impact. Additionally, environmental goals are set on a per unit basis and, given the growth of the community, have not resulted in actual reductions of the community's environmental footprint. Another aspect of these targets that is problematic is the fact that many of the sustainability and environmental initiatives undertaken in Canmore are voluntary and educational and rely on informal mechanisms to achieve compliance rather than on mandatory regulations or disciplinary measures. The value that some social actors place on environmental integrity and sustainability has meant that voluntary actions have accomplished progress on some fronts, particularly with regards to targets set for the Town of Canmore facilities and operations. However, environmental gains achieved through voluntary acts are often overcome by the impact of industrial development. In the case of water, for example, goals set to reduce per person residential water consumption and the proportion of water system leakage have nearly been achieved, but increased demand from the industrial, commercial, and institutional sectors have resulted in substantial increases in the total quantity of water consumed (Biosphere Institute of the Bow Valley 2008). Similarly, the per capita level of waste being landfilled is double the target level set out in the Solid Waste Action Plan, due in large part to the high rate of construction and demolition (Biosphere Institute of the Bow Valley 2008).

While some participants thought that the Town was doing very well in addressing environmental issues others were critical of the approach taken to address sustainability and environmental issues. Some thought that development geared to the non-permanent population had been going at too fast a pace and the implications of this were that environmental concerns were not being fully addressed in local decision-making. There also appears to be some conflict between groups advocating for conservation and the development industry.

“Finding that balance between environmental conservation and protection and development is paramount in a lot of peoples’ minds. ... With respect to the internal forces that we have control over here in town, there’s been some pretty good efforts made to try and achieve that balance. It’s certainly moving. [It was] more weighted towards development for awhile but I think there’s been a concerted effort to try and bring a bit of sanity back to the level of growth and the quality of growth” (Municipal Government, Canmore, September 2008)

“You have 50% of the population that’s been only here for 5 years, and there’s a number of weekenders that fly in from Toronto or Chicago or New York or Los Angeles or drive from Edmonton or Calgary ... I mean it’s impossible to even imagine sustainability or imagine an appropriate and intelligent response to climate change threats when you’re working under those types of parameters. It’s just impossible. By design you cannot achieve those goals. By the very structure and nature of your community and how it’s been altered and overwhelmed by these types of habits, practices and weekend interests, you can’t have sustainability. Now we do a lot of token things here, there are signs at the railway crossing asking people not to idle their cars and no one does. This place is very much on top and very little on the substantive action in terms of climate issues.” (NGO, Canmore, November 2008)

#### **4.2.1.7 Climate Change Beliefs**

When participants were asked about the attention being paid to climate change in Canmore, there were a variety of opinions that emerge. They varied according to whether or not the participant thought most people

believe it to be real, and how much climate change they thought climate change was a factor in community decision-making. For example,

“If you went out on the street corner and polled people about climate change “is it real?” “Is it a concern?” “Do we need to change our behaviour?” the majority of people would agree. There’s not a lot of disagreement in the community about whether or not it’s real or whether or not it matters.” (Municipal Government, Canmore, September 2008)

“[Its] very, very polarized; [some people are] saying definitely global warming is happening, we have to save the planet tomorrow ... and then you’ll find the extremists that’ll say its total crap”.” (Municipal Government, Canmore, September 2008)

“No [I’ve never heard anybody talking about climate change issues in the community] ... It’s never entered into any kind of budgetary, planning, nothing.” (Municipal Government, Canmore, September 2008)

In Canmore, all six interviewees from non-government organizations identified climate change as having a varying degree of importance within their organization. Two participants identified climate change as central to their organization’s mandate (The Rocky Mountain Education Society and the Western Watersheds Research Collaborative). Representatives of environmental organizations such as the Biosphere Institute and Water Matters acknowledged climate change as an explicit organizational concern. In some cases, research was being done to identify the provincial and regional impacts of climate change so that this could be considered in decision-making and policy. Other organizations were carrying out initiatives aimed at raising awareness amongst citizens and encouraging alternative behaviour. One representative of a local NGO said that her organization had not looked at climate change directly. However, her participation in

collaborative governance processes, including the Sustainability Hub and the Natural Step Program, had exposed her to the issue and allowed the organization to have input into community conversations about climate change.

Within municipal government, the majority of participants (six out of seven) suggested that climate change was a topic of interest within their organization, however a few said that it was not considered to be an explicit priority. A few comments (five) suggest that the efforts put into addressing sustainability concerns and to integrate sustainability into governance were believed to address climate change indirectly. For example, the following comments suggest that different initiatives or policies were leading to reduced contributions to climate change despite a lack of explicit recognition of those consequences.

“We talk about doing things like reducing our emissions, reducing our energy consumption, making sure our buildings are retro-fitted and run efficiently and effectively, but that’s not ever said “because of climate change.”” (Municipal Government, Canmore, September 2008)

“There’s a very strong push in that document [the new Community Sustainability Plan] towards different land use patterns that’s increased urban density, mixed uses, transit sustainable development. So we’re moving and that [is] ... partly a reflection of the need to reduce vehicle use and greenhouse gas [emissions] but again there’s not a direct sort of [response to] ... climate change ... They’re all sort of incidental. They’re supported because people know that there is the A B connection, it’s just not A follows B.” (Municipal Government, Canmore, September 2008)

Several secondary documents suggest that indeed climate change has been an issue of concern that has been addressed by the Town of Canmore. According to the Energy Management Action Plan (The Sheltair Group 2005), Canmore’s



Town Council joined the Federation of Canadian Municipalities Partnership for Climate Protection Program in 1999. This program follows the same 5-milestones model as the Environmental Care Program discussed in the section above.

Updates on the achievement of these milestones are presented on the Town of Canmore's website and in several other monitoring documents.

According to the Town of Canmore (2010b) website, Milestone One was completed in 2002; a baseline inventory of emissions and a profile of energy use for the years 1995 and 2000. That same year they also accomplished Milestone Two by setting and committing to emissions reduction targets. The target committed to by the Town of Canmore is to reduce the absolute level of GHG emissions by 6% below 2000 levels by 2012, including a 20% reduction of emissions from the Town of Canmore operations.

Milestone three was the Energy Management Action Plan that was completed in 2005. This plan presents an energy and emissions inventory for 2000 and a forecast for 2012 business-as-usual emissions. Eleven specific goals for energy and emissions management are laid out in the plan, along with eight progress indicators to measure movement towards the achievement of these goals. The existing programs that are believed to support these goals are listed as well as a host of proposed corporate and community initiatives. For proposed initiatives, a limited cost-benefit analysis, reduction estimation, and timeline are provided. The responsibility for each of these initiatives is also listed.

As for Milestone Four, the Town of Canmore's website states that some of the Town's corporate initiatives have been implemented. The corporate fleet now

uses alternative fuels, programs have been implemented for fleet rationalization and vehicle efficiency, 90% of Town facilities have had lighting retrofits, a green building policy has been adopted, the Town is purchasing 40% of its need from green power sources, and a sustainable purchasing policy has been adopted. Two education and public outreach programs have also been completed by the Biosphere Institute including the One Tonne Challenge and Save a Watt.

Milestone Five is to monitor the success of initiatives and revise plans and policies accordingly. The Town has reported on the implementation of initiatives however information about their effectiveness is absent. The 2008 Community Monitoring Report found that current and accessible data on energy use and air quality was lacking, and it concluded that the determination of emission changes was unattainable. The report also points out that 80% of the community's emissions are from the residential and commercial sectors and they represent the greatest opportunity for reductions.

#### **4.2.1.8 Canmore's Adaptive Capacity**

Governance in Canmore is challenged by the high level of growth in the community. In particular, the growth of the non-permanent population has contributed to a loss of low-income groups and families as the cost of living has risen. It has also played a part in conflict between developers and conservationists as development tailored to the demands of this group contributes to the community's impact on the surrounding environment. Additionally, non-permanent residents put added pressure on local infrastructure and services, often

without adequate funding, and this group lacks engagement in community governance issues.

The local economy in Canmore is largely tourism-based and the natural environment is what attracts both tourists and more long-term visitors. This indicates a need for environmental protection and the integration of environmental concerns into governance. Consequently community governance is managed within a sustainability paradigm, and innovative policies and programs aimed at putting sustainability values into practice and better managing the environmental impacts of development have been developed and implemented. Environmental stewardship has become an important consideration in local decision-making and there is an eco-centric environmental perspective espoused within governance institutions. Additionally, there are a multitude of environmental organizations involved in local governance and many sustainability and environmental programs being offered in the community.

These facets of governance suggest that Canmore has the capacity to adapt to change in a flexible fashion that encourages innovation. New experimental policies such as the Sustainability Screening Report reflect a novel approach to community governance and institutional learning which will benefit Canmore when dealing with future challenges. Although some of the measures used to achieve sustainability or reduce the community's environmental footprint are not entirely effective, the willingness of diverse institutional actors to contribute to local governance, local knowledge of sustainability principles, and community environmentalism and conservation values are likely to keep

accountability high. Local awareness and concern about environmental issues also mean that new approaches to environmental governance are more likely to be acceptable to residents. Many governance actors are already questioning the sustainability of tourism and particular types of development and asking difficult questions about limits to growth.

With regard to climate change, participants did not articulate a consistent assessment of beliefs however; the majority of organizations were either offering educational and behavioural programs or integrating information about climate change into decision-making. These programs have the potential to increase local knowledge and may lead to the increasing concern about climate change within community culture and norms. Within municipal government, there seems to be a lack of recognition that climate change is a rationale for the Energy Management Action Plan and subsequent programs aimed at reducing energy consumption. There also appears to be a lack of follow-through in monitoring the success of energy reduction programs and subsequent accountability for reductions in GHG emissions. Despite these challenges, participation in the Natural Step and a focus on sustainability are contributing to behavioural changes (such as the development of green building codes and practices) that have the potential to reduce future emissions. The municipal government is also showing leadership through its own procurement and operational policies.

## **4.2.2 High Level**

### **4.2.2.1 Demographics**

The town of High Level has a population of 3887 (Statistics Canada 2006). It is a remote community located in northern Alberta about 800 km north of Edmonton and 725 km south of Yellowknife. About 9% of the province's total population resides in Northern Alberta including a large proportion of Aboriginal peoples. 21.8 % of the town's population, nearly 900 people, self-identified as Aboriginal in the 2006 Census (Statistics Canada 2008). Additionally, there are several First Nations reserves and communities in the area surrounding High Level. First Nations people in the region include the Beaver, Cree, Slavey, Chipewyan, and Dene Tha whom have inhabited Northern Alberta for centuries. Consequently, there are several Métis and First Nations organizations that operate in the Town of High Level.

High Level's economy is dependent on natural resource industries including forestry, oil and gas, and agriculture. Agriculture in the region includes approximately 660 farms and employs more than 800 farm operators (Regional Economical Development Initiative [REDI] 2009). High Level also has one of the northernmost grain terminals in Canada and receives grain from up to 120 kms away (Town of High Level 2009a). The predominant crops in this area include wheat, canola and oats, while the major livestock species are cattle, elk and bison.

Several value-added and service businesses are also supported by the agricultural industry.

High Level has become the main centre for the region's logging and forestry industry. There are two mills located in High Level; Tolco's sawmill and Footner Forest Products oriented strand board (OSB) mill. There are also many smaller forestry operators active in the regional forest industry and together they provide permanent employment to some 700 people and seasonal jobs for an additional 550 (REDI 2009a).

The High Level region has also had an active oilfield industry for decades. The oilfields at Rainbow Lake, Zama and Virgo have been under development since the sixties and continued exploration activities have contributed to the development of High Level as an oil and gas service centre (Town of High Level 2004). The community also acts as a transportation and service centre for the larger region (REDI 2009a). More than 400 people in the region are permanently employed in the oil and gas industry and this number increases to about 5000 workers in the winter season (REDI 2009a). Within the Town of High Level there are also over 1000 hotel or motel rooms available in the 10 local establishments (Town of High Level 2009a). The tourism, hospitality and retails sectors also provide important services for permanent and transient populations in High Level.

#### **4.2.2.2 Governance Challenge: Economic Downturn**

The central concerns that dominate governance in High Level were found to be primarily economic. Nine out of eleven participants identified economic

concerns as one of the chief worries in the community. They discussed the decline of the local economy due to difficulties in the forestry industry and a slow-down in oil and gas development. The local Oriented Strand Board (OSB) Mill, Footner, closed down in 2007 resulting in both direct and indirect job losses. The slowdown in the forestry industry was additionally causing some concern that the other local lumber mill, Tolco, would close its doors. The following participant discussed how the first mill closure impacted the community;

“When the mill shut down the big concern was what are these people going to do? ... Some of them found jobs in the oil patch ... others just packed up and moved out of town.” (Town councillor, High Level, September 2008)

In November of 2009, the closure of the other local forestry mill, Tolko, was announced. According to Council Meeting Minutes, in 2007 Tolko directly employed 225 persons and 475 persons indirectly in the High Level region with annual payroll of \$25 million (Town of High Level November 26, 2007). The Mayor of High Level had the following to say about what could be done to mitigate the effects of the mill closure;

“The Town and County will have met with Premier Stelmach ... [but] it is hard to know what the outcome will be. I am hopeful that with all [the] trouble we have had in the last few years, starting with the Footner closure in 2007 and the resulting layoff of about 200 people followed by the decimation of our oil patch and this last hit to our families and local businesses, the Province and the Federal governments will reach out and support us in a meaningful way. I do know that when things get tough for our community and our region, people pull together to help each other get through it.” (Town of High Level 2009b)

Employees from Tolko however, ratified an agreement with the company whereby workers get a reduced wage during times of poor market conditions

(Tolko Industries 2009). This allowed the company to resume mill operations but was conditional upon the ability to maintain strong cost control and improve productivity.

Some of the other local businesses were similarly struggling with financial troubles. For example, in September of 2008 High Level's Town Council was debating about providing a \$350,000 loan to the local Fox Haven Golf and Country Club that had built up a debt and was struggling with financial difficulties. Coverage of the issue in the local newspaper showed that Town Council was asking taxpayers to discuss if having the golf course was important to them given its ability to attract people to the community. Residents wondered if it was more important to put money into keeping the golf course or to invest in other things that the community needed such as a daycare facility. A participant described the resulting debate occurring within local decision-making:

"If we provide that assistance ... it does have an impact on the town and planning and it might have an impact on the taxpayers. It also opens the door, once we lend the golf course money, how do you tell another organization that they are not as important as a golf course? But it is an asset to our community; it is a draw for tourism. ... The bottom line is long-term what kind of impact is this going to have on the town. Are we compromising our futures?" (High Level, October 2008)

There was also some discussion of the need for economic diversification and the exploration of alternative economic opportunities. One participant described how the dependence on revenue streams from natural resource industries can be problematic for governance and how fluctuations can potentially affect local capacity.

"Oil and gas, and forestry are two of our major contributors ... so we



really follow those cycles ... with the oil and gas boom and bust and now forestry starting to tank. We had a mill shut down in High Level that's about two million in investments that we don't get ... this year is predicted to be the busiest year on record for oil and gas so ... that will be five thousand people come January ... It will cause problems on our infrastructure, our ability to house and deal with the people" (Municipal Government, High Level Region, October 2008)

Another described some of the effort being put into finding new economic arrangements;

"We have actually been working with the region of wood buffalo ... trying to look at different things for our labour force partnership. They need people so we are working out some type of contract where [workers get] 10 days off and come home for 4 days. We are looking at expanding the tourism of the region ... we are also trying to establish a destination marketing organization right now ... we are looking at the infrastructure [that] we have and what infrastructure would benefit the region. We are looking at health care, transportation ... we are also looking at investors coming to the region" (NGO, High Level, October 2008)

In early 2010, the Mayor of High Level announced that the Town had signed a Memorandum of Understanding with Mascoma Corporation, an American renewable energy company, to build an ethanol plant in High Level commencing in 2011 (Town of High Level 2010). Construction will likely result in a boom of temporary employment as the facility is built. In the long-term, the plant is anticipated to employ some 50 workers directly and support an additional 450 related jobs.

#### **4.2.2.3 The Retention of Community Residents**

Several interview participants discussed the difficulties that High Level is having in keeping permanent citizens and attracting new residents. They stressed the need

to retain and attract residents to the community and had several suggestions about how to go about it. The solutions included the development of social capital, community engagement and attraction amenities.

“Our communities really need to start to invest in our social development ... If we ever want people to stay; we need to look into what people want in a community. ... We really need to work on the social infrastructure in our town so that the attractors outweigh the deterrents.” (Town Council High Level, October 2008)

“If we get more people involved in the community they are going to feel more comfortable here and stay here longer. ... We need more amenities that are going to attract people [and get them] to stay here, so we are going to need a lot of facilities, we are going to need a daycare. ... We need all of the things that make a community grow, like the social programs.” (NGO, High level, October 2008)

A 2006 Seniors Housing Needs Assessment supports this case. It states that “people are leaving High Level when they retire ... those that retire at 65 years typically want amenities and therefore relocate” (Town of High Level, Council Meeting Minutes, December 11, 2006).

#### **4.2.2.4 Non-Permanent Workforce**

In High Level temporary residents come to the community for work in the forestry and oil and gas industries. These transient workers usually stay in town temporarily but have a permanent residence elsewhere. For seasonal workers, this time period is usually more than 30 days but less than 6 months (NADC 2006). Other transient workers however, come for a longer period of time; usually for a one or two year contract. According to a preliminary report to the Northern Alberta Development Council (NADC 2006), between 22.3% and 30.1% of the

population of the Municipal District of Mackenzie, within which High Level is located, is made up of transient workers. This report notes however that transient workers are not counted in the provincial census thus it can be difficult to get current data on this population.

Concerns about the impacts of transient workers on the community emerged in the interviews. Out of the eleven participants interviewed in High Level, three referred to the transient nature of the community directly. Two participants additionally discussed the transient nature of the community indirectly. They talked about the impacts of having transient workers coming into and out of the community for work in natural resource industries. These participants identified the repercussions of having a large non-permanent population noting that transient workers have limited engagement in the community. They described the mindset taken by the majority of short-term workers;

“A lot of people will come here just to work and not to be involved in the community. So when people are not involved ... then ... they come here for themselves [and] it kinda affects the rest of the community.”  
(Municipal Council, High Level, October 2008)

“People come here for their big one year contract and then they leave so they don’t really become a part of the community because they know they are leaving anyways” (NGO, High Level, October 2008)

Another participant talked about how high employee turnover meant that training becomes an increasingly time-consuming activity and that staff uncertainties were a constraint for organizational planning. For those that do get

involved in the community but subsequently leave, the continuity of that work or contribution to the community is disrupted.

“Transiency is probably one of the more important issues that we face. ... when you have volunteers [that] are involved then they leave. Who’s there to keep it going? ... when you are constantly training staff ... you’re training them to do new tasks, and when the front line people are trained then they go through a season or through to the next year. And that season you might not have the same person ... and then you’re using that time going back to the basics ... and it’s not just the municipality that has high turnover it’s the whole community right so it effects everybody.” (Municipal Government, High Level, October 2008)

The lack of funding available to provide service for transient workers was another repercussion identified by two participants. The lack of funding relates to how the province calculates “per capita funding” for municipalities. According to a report to NADC (2006), ten out of 21 rural municipalities within their boundaries have a shadow population of at least 10% of the permanent population, including High Level. The majority of these transient workers however are not included in the annual provincial census that is used to calculate provincial funding for municipal governments.

#### **4.2.2.5 Social Capital**

When asked about the sense of community in High Level, six out of eleven participants said they thought that High Level had a strong sense of community.

“When I moved here it was very welcoming. It was a small tight-knit community. I was approached by a lot of members of the community right away ... people were kind and [they] ask you to get involved because if you’re not involved you might be lost. I have heard it’s been

different [for other people] but for me it's been a very welcoming experience.” (Municipal Government, High Level, October 2008)

However, as was seen in the above sections High Level is facing several challenges that constrain social capital. Participants indicated that collective social ties and feelings of social cohesion amongst permanent residents are undermined by the presence of both short and longer term temporary residents many of which are not engaged in community activities. Furthermore, economic decline in the region's major industries has caused job losses. Combined with a lack of amenities and the community's geographic distance to a major urban centre, the ability to attract new residents and retain permanent ones is a major challenge for engagement. The following two comments indicate that there is a core group of people that has taken on addressing community concerns but that wider community engagement in this endeavour is limited.

“I have been at meetings and there has been a different group at each one of them but it's kind of the same 20 people ... but that is something that we are defiantly trying to do is to have more community engagement.” (NGO, High Level, October 2008)

“We have a lot of social organizations ... [but] a lot of the people who are sitting on these committees overlap ... [there is] a core group of people who are really concerned with the community and then they get completely burnt out and say they can't do it all. We need to get more people involved with the different operations of the community. Interagency deals with mostly the social issues, the reason for that organization starting up was to deal with that issue. Instead of a committee of two people it is a group where they can all meet together to get people to work as a group.” (NGO, High Level, October 2008)

The majority of participants from High Level (nine out of eleven) said that they network with organizations in their region; only two referred directly to “regional

partnerships” (on municipal service sharing and economic development) and the remainder discussed informal or formal working relationships with organizations in the region like the Towns of Rainbow Lake and Fort Vermillion.

“We do a lot of networking with other municipalities ... especially for fire services and disaster planning.” (Municipal Government, High Level, September 2008)

“We are working on service sharing with most of the municipalities that we work with [which] usually involves regional partnerships [between] Métis and First Nations, the Town Chief, the Town of Rainbow Lake, [and] the three municipalities.” (Municipal Government, High Level, September 2008)

A few challenges were noted regarding the relationships between different organizations in the community or the greater region. Three participants referred to difficulties dealing with competing interests in land and resource management, two discussed a strained relationship with a neighbouring municipality, and another stated that organizations in the community were not working together. Despite these challenges, the majority of interview participants (six) said that relationships between organizations at these levels were positive overall.

A couple of issues with the vertical networks between community and regional organization, and central government agencies also emerged. Five participants out of eleven said that they have indirect input into provincial-level decision-making either through specific elected officials or through associations to which their organization belongs. Only two participants said that they are able to provide direct input into provincial decision-making that affects High Level.

“As an employee I don’t have a lot of input in [provincial decision-making]. I have my input in conversations I have with councilmen because that is a political thing. ... They go to the golf tournaments and

the dinners where all the important decisions are made.” (Municipal Government, High Level Region, October 2008)

“We have a pretty good relationship with our MLA ... Every time that there is consultation and things we can participate in, we take advantage of that. We also take part in our municipal association ... that’s a venue that listens to our opinions. Our MLA is our best connection to the government and is pretty good at listening to our concerns.” (Municipal Government, High Level, October 2008)

However, a large number of comments were made that suggest that provincial and federal regulations constrain the autonomy of local governance processes. For example, several mentioned the feeling of being ignored by provincial decision-makers. They described the frustration of attempting to get support on issues that are important to the community and to provide input into provincial-level decision-making.

“There was a task force ... [on] affordable housing. When the government [of Alberta] came out with the two studies that they did and awarded dollars to the communities for the affordable housing program, High Level wasn’t even on the list... like we didn’t even qualify... And we absolutely qualify for the affordable housing as set out by the government’s criteria, as far as our average rental rates, vacancy rates and the number of jobs that were available. We [had] top levels for all of [those criteria] and didn’t get approval for funding to start [an affordable housing] project like that. They have just let us down.” (NGO, High Level, October 2008).

“Some of the provincial and federal regulations limit what we can accomplish. We cannot intervene on provincial regulations no matter how much we get stiffed, how ever much we write letters and want their properties cleaned up. They always fall back on provincial regulations saying that this is what Alberta Environment says and so it is other regulations outside of our own that limit what we can accomplish.” (High Level, Municipal Government, September 2008)

#### ***4.2.2.5.1 Racial and Class Divisions***

Another problem that emerged within community governance in High Level was in regards to the social connections between Aboriginal and non-Aboriginal people. Racial and class divisions in the community became apparent at the individual and organizational levels along with indications that governance at higher levels reflected these same nuisances (more about this will be covered in the following section). Although it is beyond the scope of this study to explore the adaptive capacity of Aboriginal peoples in-depth, there are several indicators that suggest that Aboriginal people in the High Level region are marginalized.

According to the 2006 Aboriginal Population Profile and the 2006 census, the educational attainment and income of the roughly 475 Métis and 365 First Nations residents of High Level were both much lower than the averages for both Aboriginal and non-Aboriginal people in the province. Approximately 3.6% of Aboriginal people in the community had attained a university education. This is much lower than 11.5% of the total population that had received university schooling. However these numbers are also both significantly lower than the percentage of Albertans that had university education (21.5%). Similarly, Aboriginal incomes in High Level are lower than the average income in High Level and the provincial averages. The median income for all individuals 15 years of age and older in High Level was \$34,398; also somewhat higher than the provincial median of \$28,896 but the median income for Aboriginal individual was only \$21,758. It should be noted that these averages only provide partial insight into educational and income disparities between Aboriginal and non-Aboriginal people in High Level because comparisons only show the difference



between averages for Aboriginal people and averages for the combined (non-Aboriginal and Aboriginal) population. In other words, if there were data available for comparisons between Aboriginal and non-Aboriginal people, the averages for the latter would be greater than those for the combined population.

These statistics also only provide insight into the socio-economic status of permanent residents in High Level. There is also a considerable group of non-permanent residents identified by interview participants as “street people”.

Problems with street people were said to be one of the top community concerns in High Level by two participants. A 2008 Citizen Satisfaction Survey, carried out by the Town of High Level, also showed that loitering was the top concern among the majority of respondents. 115 out of 152 considered it a major concern compared to unsightly properties (78), security of property and personal safety (75), water quality (63), and the level of property taxes (51). When asked to identify the major issues that the Town should address 60 comments referred to street people or loitering, vagrancy, homelessness or alcoholism. Many of these comments reflect racism and class discrimination as well as frustration at facing this seemingly insurmountable crisis in the community.

Interview participants said that street people were mostly Aboriginal people that have homes on reserves outside of High Level. They are not considered homeless, rather they “have chosen to not go back because of the issues they are facing out there [on the reserves]” (NGO, High Level, October 2008). Another person similarly said that “they actually do have homes on the reserve they just choose not to go there. ... A lot of them are alcoholics and drug

addicts and so they live on the streets” (Aboriginal Organization, High Level, October 2008).

While the prospect of living on the streets doesn’t seem ideal, the problems facing many people living on reserves and in Aboriginal communities in the North may be much more daunting. Indian and Northern Affairs, for example, produced a Community Well Being index from the 2001 Census as a way of measuring and comparing well-being in Canadian communities (Indian and Northern Affairs Canada [INAC] 2009). The index combines measures of income, education, labour force activity, and housing conditions into a single score that ranges from zero to one hundred. Scores were calculated for each community that participated in the 2001 Census and a comparison showed that the average score for First Nations communities was 60 while the average score for non-First nations’ communities was 84. The scores for First Nations communities in the High Level region such as the Dene Tha’ (57), Little Red River Cree (45), Beaver First Nation (70) and Tallcree (59), were much lower than the average for non-first nations communities (84). Research has also shown that discrepancies between the status of Aboriginal and non-Aboriginal peoples in Canada are most marked for those living on reserves where unemployment, poor physical and mental health, alcohol and drug dependence, violence, and poverty are often widespread (Jennissen 1992).

A Ten Thousand Five (10005) House (2007) status report was provided to High Level’s Town Council for a street-based initiative to help individuals living on the streets of High Level avoid the justice and policing systems and ultimately

reunite them with their families. The report highlights several trends including a 60% increase in the number of individuals using the shelter from 2003 to 2006. This increase was predominantly female individuals. Also, several of the shelters clients were found to visit the local Alcohol and Drug Addictions Counselling office (AADAC) however, the nearest detoxification centre is located 450 kms from the town and so none had gone for detoxification despite interest. The report also provided a projection of the Ten Thousand Five House Project's financial needs for 2007/2008. It was estimated that \$300,000.00 per year would allow the shelter to extend its operations to 7 days per week 24 hours per day and provide day programming that would further reduce the target population's contact with the justice system and increase contact with regional health and community service providers.

Although the RCMP has reported several times that the number of people incarcerated in High Level is lower than it would be without the shelter, street people continue to be a topic of debate amongst the public and town council. Members of the public, for example, have raised safety concerns at community meetings and Council has responded by hiring new peace officers to patrol local parks (The Echo, September 17, 2008). Several citizens have also urged Town Council to move the location of the shelter away from the downtown core as they feel that businesses and property owners should not have to deal with problems with the shelter's clientele (Town of High Level November 19, 2001 and Town of High Level November 24, 2008).

Racial divisions also emerged at the organizational level. Several participants from High Level (six out of eleven) said that First Nations organizations have only limited input into either community or regional decision-making. Although most felt uncomfortable discussing the situation, a handful of participants identified a separation between First Nations and other Aboriginal organizations in regards to some governance processes. The following two participants, for example, described the limited relationships between municipal governments and Aboriginal Governments.

“I think we handle the whole relationship with them (First Nations and Aboriginal Governments) but it’s certainly not a very good working one. It’s very inconsistent. They only come to us when they have a problem or we only go to them when there is a problem, other than that we just stay away from each other” (Municipal Government, High Level Region, October 2008)

“[There is] not a lot of interaction [with Aboriginal governments] to my knowledge, not since I have been on [Town] Council. They will meet with the administration; like we were planning on building a trail and they will come and discuss that. [But] not to any great levels.” (Municipal Government, High Level, October 2008)

Another participant said that there is a separation between First Nations and other Aboriginal organizations due to provincial funding norms, and discussed the consequences of this for dealing with common issues of concern. The participant explained that each Aboriginal group (Métis, First Nations, and Inuit) is mandated to serve a separate client group. Funding is provided only for that specific group and often for specific activities related to the nature of the organization (economic development, social services, education). The organization that this participant represented is funded to provide employment and training services for Métis

people only. A new First Nations employment centre had recently opened up in town however; the participant said that the two organizations did not work together on common projects or issues of concern. Rather, both organizations had recently run separate programs for the same type of training;

“They had one [oil and gas demonstration], then we had one. Why couldn’t we have worked together and had a better function, or higher success rate? But no they had theirs and we had ours. ... in the long run we would probably save money. Instead of paying twice for the same instruction pay once and split the costs.” (Aboriginal Organization, High Level, October 2008)

The absence of First Nations organizations was also noted at an inter-agency meeting on October 2<sup>nd</sup>, 2008. Inter-agency meetings are an informal mechanism for community and regional service organizations to gather, make connections, and share information. This meeting occurred the day after the community’s Native Friendship Centre had been damaged by fire. The Friendship Centre’s representative had the opportunity to update the group on how the Centre would continue with its normal activities and advised the group of the Centre’s needs. He informed the group as to where the Centre’s services had been relocated and that food was required to continue the operation of the soup kitchen and food bank. Attendees at the meeting then organized a food drive in response and offered support to help the Centre continue its activities. The ability of this organization to use an informal networking mechanism to successfully overcome an emergency was a great example of the importance of strong organizational connections and the pooling of resources and knowledge in the face of crisis. At this meeting however, participants remarked that no First Nations organizations

were attending inter-agency meetings. The members agreed to send an invitation to participate in these meetings in hopes of getting more First Nations organizations involved.

One interviewee mentioned attendance at an Aboriginal inter-agency meeting at the Native Friendship Centre which was intended to bring together organizations that serve Aboriginal clients. The participant described this meeting as being very similar to the non-Aboriginal-specific inter-agency meeting in that organizations update one another on their programs and initiatives. Although it was not possible to assess these meetings (it was not listed on the WebPages of the Town of High Level or other organizations), their occurrence would suggest that efforts are being made to strengthen networks between Aboriginal organizations in the region.

#### **4.2.2.6 Environmental Concerns**

Despite the prevalence of natural resource industries in High Level, environmental concerns do not appear to be a central focus for community governance. There are a few provincial and regional conservation groups that focus on northern Alberta however there are no active community environmental organizations. A couple of participants said that there is some apprehension about the environmental implications of local land use activities amongst different land users however public involvement in consultation is often lacking. For example, attendance at open houses and other stakeholder engagement events held by the

local forestry companies was generally found to be very low (High Level Woodlands 2009a).

A review of the meeting minutes from a local forestry consultation process showed that members of the public have occasionally had issues with forestry and oil and gas practices that affect local forests (High Level Woodlands 2009b). This consultation process is guided by the Public Involvement Plan developed and implemented by Tolko Industries and Footner Forest Products. It recognizes multiple stakeholders including trappers, Aboriginal groups, oil and gas, local government, special interest groups, and the general public, and identifies different opportunities for providing information to the public as well as receiving input from them. While the plan states that all communication will be documented, it contains no mention of how input will affect decision-making nor does it include a clear process for dispute resolution.

A couple of comments from interview participants suggest that there are problems with the consultation process and the incorporation of input into resource management.

“For as long as the government has taken to consulting with First Nations about land and resource matters generally, we have been at an impasse over how many consultations could or should take place. The model that has been developed by the provincial government for consultation has been rejected by the First Nations governments as inadequate and not responding to the guidance provided by the Courts of Canada. ...[the] a lack of agreement on how we should consult continues to play itself out as the Government of Alberta is continuing to develop their land use and other policy driven processes for land and resource decision-making.” (Aboriginal NGO, High Level, October 2008)

“[The First Nations] feel like they are not talking to the right person. Like [the Government of] Alberta requires us to do the job (of consultation) but Alberta may not be present at the meeting ... [and] the

First Nations have indicated that they really don't want to be discussing with us. They would really prefer to be discussing with the Government. ... And [the Provincial Government] would accept [this input] to look at it but there is nothing binding the Province to change" (Industry, High Level, November 2008)

In 2005, the Dene Tha First Nation lost a legal case against the Alberta Energy and Utilities Board which claimed that oil and gas activity in the High Level region was infringing on their traditional hunting rights. They wanted the Alberta court of Appeal to halt development and they argued that meaningful consultation had not occurred (Fenwick 2005). In the end, the court ruled that the EUB had followed internal rules regarding giving notice, allowing input and making decisions. As Fenwick (2005) notes, the claim of rights infringement gave the Dene Tha a higher status in EUB hearings but they were competing against well-financed, well-trained development consultants. He argued that they would need to acquire similar technical, financial, communication and lobbying skills in order to resolve even small issues of development and land use in the EUB forum.

"People want the resources in the area to be used wisely ... [they] want to know that what the Government is approving is for the benefit of the people of Alberta ... [that industrial activities] don't impact the environment ... You hear it mostly from First Nations ... they have an issue with the forest companies accessing the resources that they are after and they want to make sure that oil and gas is not impacting the resources that those people have used over the centuries." (Industry, High Level, November 2008)

"Our community has an average household income of about \$19,000. The value of the moose meat, the berries and the fish and other animals that they take from the forest amounts to about ... 20% of their income per year. And we've made a very strong argument for cultural sustainability, which (the forestry company), at first wash, has appeared to be willing to accommodate." (Aboriginal NGO, High Level, October 2008)



Several participants from the High Level region recognized the community's natural resource dependence and two of these participants discussed the local frame of mind towards the environment.

“In Alberta it's a catch 22. Our economy is so dependent on the environment. We are very money hungry and the thought of making drastic change at the expense of our comfortable lifestyle ... In northern Alberta we have almost a last frontier mindset ... people take issue if government is going to be making decisions that are affecting people's choice: that is not right.” (Municipal government, High Level, October 2008)

“There is a very pioneer sense; a lot of old school type mentality, around here. There isn't a whole pile of ... respect towards the land and how we utilize land and what we do. Not a whole pile of “let's be careful” ... you won't see tickets on cars when people leave their vehicles idling like you do in the city. People leave their cars idling all the time and nobody really cares.” (Municipal Government, High Level Region, October 2008)

One participant provided an example of how this attitude affects decision-making. The participant described a situation where the Town Council in High Level debated supporting a move to ban plastic bags in Alberta.

“It was decided that we would not support the movement banning plastic bags ... people didn't feel like it was right to step in and say “you cannot use plastic bags” and that people should have the choice to use plastic or paper or fabric bags.” (Municipal Government, High Level, October 2008)

Conversely, a few interview participants thought that the “green factor” was increasingly becoming a consideration in decision-making. Nonetheless, they state that economic considerations still seem to be a major factor in determining the acceptability of environmentally-friendly behaviours.

“We did an energy efficiency switch-out of light bulbs in the Arena simply because of economic reasons. Is it climate change that [people] are worried about or are they trying to reduce costs? For municipalities

it's always about dollars because dollars are always stretched. I think the changes are coming slowly but I think it is more because of an economic stance rather than a climate change stance.” (Municipal Government, High Level, September 2008)

Recycling in the area provides an example of the dominance of economic concerns over environmental. In 2003 the High Level Town Council decided to discontinue the community's recycling program operated through the Mackenzie Landfill (Town of High Level October 27, 2003). One participant explained that “it was just too expensive trucking it out of the region” (NGO, High Level, October 2008). Since then, opportunities for the public to discuss and provide input into waste management have been presented. For example, a public meeting regarding recycling was organized by the Mackenzie Regional Waste Management Commission in 2004 however no one from the public attended (Mackenzie Regional Waste Management Commission August 20th, 2004). There have also been opportunities to provide input at Town Council meetings where waste management has been discussed but public input has been limited to complaints made against paying fees (Mackenzie Regional Waste Management Commission January 8, 2008). While the Town is supportive of other organizations recycling programs, it still does not have its own program.

The Town of High Level recently received funding to develop a community sustainability plan (CSP). In 2009, a group called 20/20 High Level which is made up of two employees of the Town, two town councillors, six community members and two consultants, was established to guide the development of the CSP. This group engaged in a visioning workshop in which

they used public input from previous initiatives to develop a draft of the vision and principles for the CSP. The environmental principle that was advanced states;

“Environmental stewardship plays a vital role in our future. Emphasis is placed on responsible use of resources, reduction of waste, and regeneration of ecosystems. We collaborate with industry and invest in environmental initiatives to use energy, water and material resources efficiently. We have a minimal ecological impact because of our concentrated urban environment. We believe in promoting respect for the environment through outdoor education programs and initiatives to keep the community clean.” (Our Vision, 20/20 High Level website)

The draft CSP was provided to the public for feedback via survey and 95% of respondents either liked it or felt neutral about it although it is unclear how many members of the public actually provided feedback (High Level 20/20 2010). Since then, the steering committee have held a series of strategic workshops for local organizations and community members. It is unclear how many of these people participated in the workshops but a set of goals, targets and action items were set forth. Ten top sustainability priorities were identified including four environmental management priorities pertaining to air quality, water stewardship, land management, and community parks and natural spaces.

#### **4.2.2.7 Climate Change Beliefs**

Most respondents in High Level thought that climate change was not a high priority in the community although there has been some discussion of the issue. Only one participant thought that a number of people in the community of High Level were very concerned about climate change. From her experience, the majority of these folks were from the educational sector (Provincial Government, High Level, December 2008).

“Overall I think there is a small proportion of the community that are concerned about it [climate change] but the vast majority isn’t.”  
(Municipal Government, High Level, September 2008)

A representative of the provincial government with an office located in High Level discussed how climate change is a concern for their organization. The person said that, at the higher levels of the organization, there was a group of experts going through information to determine “how it relates to us, especially forest growth or wildlife concerns” (Provincial Government, High Level, December 2008). The participant also said that although there is a lot of information available with competing viewpoints about the impacts and how to address them, it was generally believed to be an important issue that requires a change in behaviour. At the time of the interview, the participant was not aware of any action that had been taken as a result of that information.

An interviewee from a First Nations organization mentioned that climate change had been a part of internal organizational discussions as well as their discussions with the provincial government. The participant had heard some First Nation members express concerns about the potential impacts of climate change on their well-being. He explained that “it generally gets expressed in relation to the fact that it would affect the drinking water” (Aboriginal Organization, High Level, October 2008). This concern, along with distress about the other impacts of industrial development on the landscape, has led the group to pursue the establishment of a land trust that would be set aside for conservation. The participant thought that the achievement of this undertaking and the group’s

efforts to intervene in industry's water use would be a good strategy to respond to the impacts of climate change.

Climate change concerns were found not to have infiltrated the municipal government. There weren't any hits for climate change on the Town's website. There was also no mention of climate change in any of the Town's publically available documents. The draft community sustainability plan does contain a goal to reduce GHG emissions however there is no mention of climate change and this goal is listed under the priority of addressing air quality.

Three documents from regional organizations did mention either global warming or climate change. Two of these documents were prepared by consultants for the Rural Economic Development Initiative for Northwest Alberta located in High Level. One presented the business case for economic diversification into the production of biofuels and the other discussed climate change as a motivation for tourists to reduce how much they drive (REDI 2009b; REDI 2008). The other document was a regional study carried out by the Northern Alberta Development Council (2009b) that explored the challenges to development in northern Alberta. The discussion paper reported on consultation carried out with businesses and industries in northern Alberta regarding their needs during the economic downturn as well as communities, business, industry, government and Aboriginal organizations to discuss the future of northern Alberta. The report showed that of all the key challenges, issues and potential strategies identified, only representatives from the conventional oil and gas industry identified climate change as being an issue of importance.

Despite the general lack of concern for climate change in High Level, several interviewees identified potentially significant impacts that climate change could have for the local economy. For example, a few participants mentioned that warmer temperatures would limit the ice roads upon which the oil and gas, and forestry industries depend to carry out the majority of their work for the year.

“I know there has been some talk about global warming ... if that happens, it’s going to hit hard here for the economy because a lot of the oil industry, the oil field, their business comes in the winter, because of the freeze up, a lot of the drilling is done on muskeg. And in order to get out there they have to build ice bridges or ice roads for them to get there. I think that is going to have a big impact on this area” (Aboriginal Organization, High Level, October 2008).

Some participants thought that climate change may not be a big concern because harsh winter conditions may mean that people don’t care if it gets warmer or that they even welcome that change.

“I don’t think a lot of people are very concerned with it especially with our winters being as cold as they are. December, January and the first half of February we see quite a burst of -40 every year.” (Town Council, High Level, September 2008)

“If there was global warming or a climate change for those winter months and we had more of a moderate temperature -20’s I think that you would find more people who would move to the north. Let’s face it; who wants to live in a place where it’s minus 45?” (Aboriginal Organization, High Level, October 2008)

Additionally, a representative of the Municipal Government said that climate change had briefly been discussed as a concern for the future of the community but that more immediate concerns related to economics took precedent.

#### **4.2.2.8 High Level's Adaptive Capacity**

Governance in High Level is predominantly focused on addressing economic factors like the decline of the forestry industry, subsequent job losses and the inability to retain and attract citizens. There appears to be limited support for environmental initiatives unless there are economic incentives to be had from adoption. For example, attempts to support recycling and a ban on plastic shopping bags were defeated due to cost considerations and the hindrance of individualistic choice. The ethanol plant offers prospective job creation and increased tax revenues however it will continue to demand traditional forestry jobs with low educational requirements and seasonal employment. It is likely to remain highly vulnerable to world markets, foreign investment and climate change (Lemprière et al. 2008).

The new Community Sustainability Plan has the potential to help to integrate environmental considerations into decision-making in High Level. However, future policies that put more emphasis on environmental concerns may not be acceptable unless there is an economic benefit to be had. The dominance of economic concerns in community governance and the lack of widespread concern about environmental issues suggest that acceptance may be low.

The community's dependence on natural resource industries has been problematic for community governance in that there are temporary workers present that are not engaged in the community nor included in provincial funding. The community is also struggling to retain and attract citizens given recent economic instability and a lack of amenities like a daycare and a seniors' lodge. Racial and class differences also emerged. All of these factors challenge the

development and operation of social capital that is needed to face current stressors as well as any potential impacts from climate change.

Additionally, there were some issues that arose regarding organizational networks. Several participants said that they felt ignored by the provincial government despite significant economic contributions to provincial revenue and some also thought that there is limited support for community funding needs. Aboriginal organizations were identified as having limited input into provincial and community level decision-making, particularly resource management and land use decision-making that affects their well-being. These factors appear to act as barriers for the development of community collective action toward current and future economic, environmental, and social problems.

Climate change was not considered to be a prominent concern or priority for any of the organizations involved in community governance. People in the community seem to be somewhat aware of climate change and several participants identified some potentially significant impacts of climate change for the community. Some participants thought that low concern may be a result of cold winter weather or the perspective that other concerns are more important.

#### ***4.3 Dominant Themes***

When the two communities are compared and contrasted several themes emerge. These relate to issues around financial, human, social, and cultural capital resources. Each of these shall now be reviewed in turn and the findings will compare the similarities and differences between the two communities.



Additionally, comments from provincial-level participants and secondary documents are used to indicate a more widespread issue or to discuss the unique context of communities in the province. The implications of these themes for adaptive capacity will also be explored.

#### **4.3.1.1 Financial Capital**

In Alberta, the financial capital available to fund municipal operations is generated through the collection of taxes and fees as well as through provincial and federal transfers. Property taxes are the main source of revenue for municipalities (Alberta Municipal Affairs 2010a). Property tax rates vary by municipality and are a function of the revenue required by the municipality and either the annual market value of properties or regulated standards as set out in the Municipal Government Act (Alberta Municipal Affairs 2010a). Additionally, municipalities may collect other taxes and user fees for utilities or other services like water and sewer treatment, and garbage collection.

The provincial government retains authority for oversight of tax collection and redistribution to municipalities (municipalities collect both provincial and municipal taxes on behalf of the provincial government who then redistributes some of this money according to provincial regulations). It determines which municipal activities receive funding and the level of resources attached to those activities. Since 1998, all municipalities in Alberta with a population below 20,000 have been eligible for funding from the Government of Alberta through the Municipal Sponsorship Program (Alberta Municipal Affairs 2009c). This

program provides conditional project-based grants to municipalities for either operational or capital expenditures based on population size. Bonus funding is also available for projects that meet priority criteria and/or are inter-municipal. Since 2007, the Municipal Sponsorship Program has been being replaced by the Municipal Sustainability Initiative which is intended to enable municipalities to deal with growth and sustainability (Alberta Municipal Affairs 2009c). Projects that qualify for this funding are much broader and meant to reflect local priorities. An assessment of the effectiveness of this funding in particular was beyond the scope of this study but the emphasis placed on local priorities may provide more support for communities than will occur with more stringent funding criteria.

In addition, financial capital is available for municipalities that qualify for federal funding programs like the Green Fund and the New Deal for Cities and Communities. In a similar process to provincial funding grants, local governments apply to the administrative bodies (the Federation of Canadian Municipalities and the Government of Alberta in these cases) demonstrating the eligibility of proposed projects and supplying extensive information about how funds will be used. Successful applicants enter into legally-binding agreements with the funding bodies and receive monies based on their population size and the fulfillment of regular reporting requirements.

Non-government organizations in Alberta have several different funding sources including membership dues, the sale of goods and services, grants and donations. In a similar way to municipal governments, NGOs are eligible for both government and non-government funding primarily based on project and

organizational activity. The majority of these grants follow a similar application and reporting procedures.

A number of interview participants said that the finances their organization has access to are sufficient to meet their clients' service needs. However, a sizeable group did say that their organizations face financial constraints. This included nine (out of thirteen) participants from Canmore, six (out of eleven) from High Level, and three (out of eight) at the provincial level. Non-government or civil society organizations and municipal governments in particular were identified as having difficulties operating on their budgets and grants.

“In Canada, the slice of money pie that municipal governments get is fairly miniscule compared to the money pots that are used by provincial and federal governments and our access to funding is somewhat limited. It's tied to the property-tax base for the most part so people start to scream quite loudly when their property taxes double and double again ... and it's always an issue trying to convince the provincial and federal governments that we need the money.” (NGO, Alberta, January 2009)

Seven out of eight provincial participants said that smaller rural communities are especially constrained financially. They implied that these communities had less capacity to adapt to climate change because they were already struggling with financial viability.

“Capacity, capacity, capacity is the big [issue for municipalities] and of course the smaller you get, the bigger that capacity is an issue ... there is some money available [for climate change] but it's knowing that money is available and then having the time to access it ... but again to cover everything it just draws on the dollars. And the issue with a lot of communities [is that] they're just trying to keep up with fixing potholes.” (NGO, Alberta, January 2009)

“we often see [that] rural communities and First Nations have substantially less financial resources than larger cities in terms of being able to deal with climate change ... resource-dependent communities and low-income communities are often more vulnerable as well so addressing the disparity and the distribution of adaptive capacity across the province and across the country is going to be a very big challenge” (NGO, Alberta, January 2009)

Indeed, secondary documents show that municipal districts and counties are more reliant on provincial and federal transfers than larger communities in Alberta, with a significant number receiving between 25 and 40 percent of their operating revenues from other levels of government (Alberta Association of Municipal Districts & Counties [AAMDC] 2009a). Municipalities in northern Alberta receive only a small portion of their economic contributions and government revenues back for operations despite their large contribution (NADC 2009a). The financial capacity of Canmore and High Level were not explored in detail however, these factors would seem to suggest that Canmore would have more financial resources at its disposal than High Level, particularly given the high property value in Canmore.

#### **4.3.1.2 Human Capital**

Eighteen (out of thirty two) participants commonly said that human capital is an organizational challenge. These challenges generally relate to the retirement of the older generation and urbanization trends; however educational attainment and expertise were particular issues that arose for smaller rural communities.

“When you say you need this skill set it’s not going to be as easy to find it in a small town as it would be in a larger town.” (NGO, High Level, October 2008)

“Here in the north ... the experts do not live up here ... the councillors [in the region] are farmers and they are Mennonite ... many of them do not do higher education.” (Provincial Government, High Level, December 2008).

In Canmore, the knowledge and skills required to address sustainability and climate change issues already exist in the community as many people are currently working on environmental initiatives. For example, two participants from Canmore said that they had taken courses regarding climate change; another said that she taught classes on climate change, one had written a book about the impacts of climate change on the region and three participants said that they had learned about some of the potential impacts of climate change at a conference. The level of post-secondary education in Canmore is also quite high. As was seen above, the percentage of the population that has university education is considerably higher than the provincial average and drastically so when compared with education attainment in High Level.

In High Level, human capital constraints were apparent although a few participants said that they felt staff numbers were sufficient to serve the relatively low population. Post-secondary educational attainment in High Level is low which would suggest that the amount of human capital available to address current and future stresses is limited. Subsequently, the likelihood that many governance actors have been exposed to any in-depth information about climate change is small. Rather a handful of participants said that what they knew about climate change came from what they heard in the media. Additionally, a couple of

participants mentioned that High Level's geographic location was a challenge to attract educated staff as well as to get consultants to serve the region.

Several provincial interviewees also said that human resource constraints were a particular issue for rural communities in Alberta and they identified "expertise" as a predominant issue for communities in their discussion of climate change and adaptation.

"Something like 60% of senior managers ... will be retiring in the next 5 years. So [that's] fairly substantial turnover in senior management amongst rural municipalities over the next short period of time." (NGO, Alberta, January 2009)

#### **4.3.1.3 Social Capital**

Participation in community, regional and provincial networks was largely described as a way for organizations to receive information and to provide input into different governance processes. Both informal and formal relationships were found to be important for the transmission of information and resources. The formal relationships discussed by participants ranged from memberships in larger associations to contractual service provision. On the other hand, informal meetings between community organizations and contact with past colleagues were also discussed as important ways to access resources. For example, 23 participants described their networks with governance actors external to their community of practice or place. These connections were made through participation in activities like conferences and multi-stakeholder committees where institutional actors have contrasting social identity but shared interests or objectives (Pelling and High 2005).

The most common limitation on collaboration identified by all participants was normative or ideological differences. Often participants described diverse perspectives about a situation or the appropriate way to address a problem. The idiom of “not seeing eye to eye” was noted several times. However, the strategies used by individuals and organizations to overcome this type of constraint were also discussed. These included the use of a consensus-based system of governance where decisions are based on agreement and compromise, and majority-based systems where members have equal voting power and decisions are based on a majority vote. This suggests that when institutional actors face normative differences collaboration does not come to a standstill. Rather there are strategies that can be employed to overcome these differences and make decisions that satisfy all parties albeit with some compromise.

“There are always constraints that exist but I think most of those groups tend to work on a consensus-based model. ... They may not be 100% in agreement but they can live with the decision.” (Industry, Alberta, December 2008)

“The resolution process is a way to say to government there are a number of rural municipalities, the majority of which agree on direction in this area, and we’re seeking change or an amendment or additional funding. It’s a good way to interface with the provincial and to a degree the federal government. (NGO, Alberta, January 2009)

#### ***4.3.1.3.1 Community Networks***

Comments in the community sections showed that social capital in both communities is challenged by the presence of non-permanent groups that lack engagement with community governance and that the presence of non-permanent residents subtracts from feelings of social cohesion among residents. Despite this

commonality, the engagement of organizations in community governance and the collective sense of responsibility amongst permanent citizens in the two communities appear to be quite different.

In Canmore, horizontal community networks appear to be quite strong as evidenced by the involvement of a number of non-governmental organizations in governance; particularly environmental organizations. There also appears to be high participation in collaborative governance processes and many partnerships between organizations with similar goals. Additionally, there appears to be a collective sense of responsibility amongst institutional actors to address community challenges. Nonetheless, some conflict between environmental conservation and development groups did emerge.

In contrast, High Level is challenged by weaker community networks as evidenced by the lack of citizen engagement in governance and racial/class divisions. Collective social ties are weakened by the presence of both short and longer-term temporary residents many with little or no engagement in local initiatives. Economic decline in the region's major industries has caused job losses that, combined with a lack of amenities and the community's geographic distance to a major urban centre, limit the community's ability to attract new residents and retain permanent ones. Furthermore, racial and class issues emerged between Aboriginal and non-Aboriginal groups. These are major challenges for collective action in High Level.

#### ***4.3.1.3.2 Regional Networks***



Regional governance networks materialized as being noteworthy on the whole. Eleven out of thirteen participants from Canmore said that they have some form of regional connection with other organizations. Six participants discussed “regional partners” directly; while five referred indirectly to relationships with regional organizations or participation in regional collaborations or organizations located in the region outside of the community. For example, participants mentioned working with the Biosphere Institute of the Bow Valley, participating in regional initiatives like the Bow Valley Regional Waste Commission, as well as having regional partnerships with groups like the Prairie Adaptation Research Collaborative. Nine out of eleven participants from High Level similarly said that they work with organizations in their region; two referred directly to “regional partnerships” and seven described working relationships with other organizations in the region.

In both communities participation in these regional networks was described as being an important part of dealing with collective issues of waste, emergency response and economic development. In Canmore it was additionally noted that regional networks play a role in sustainability efforts. Comments about regional governance networks spoke to both the benefits and drawbacks of participating in these types of partnerships however they were described as being beneficial overall. For example, in both communities and at the provincial level participants from fire and emergency service organizations discussed ‘mutual aid’. This is a type of formal agreement between emergency service organizations operating in adjacent jurisdictions whereby parties agree to share resources and

assist each other during urgent situations. Participants identified the benefits of mutual aid as having additional support in times of need, increased capacity to deal with events, and identical training standards. Some of the challenges associated with these agreements include the confusion/frustration that can arise from a lack of coordination and the costs associated with having to pay for this assistance.

Provincial-level participant comments and several secondary documents suggest that a regional approach to governance is increasingly the norm for municipalities in Alberta. The provincial government provides financial incentives for municipal stakeholder collaboration and the benefits of these types of relationships are increasingly being championed by different governance actors. For example, a 2007 Alberta Municipal Affairs and Housing survey of municipal Chief Administrative Officers reported that CAOs are devoting significantly more time to working with municipal neighbours and increasingly taking part in inter-municipal management processes (Alberta Municipal Affairs 2007). Respondents stated that the provincial government had been encouraging greater inter-municipal and regional approaches to deal with issues of common concern and they suggested that more incentives be established to encourage this type of behaviour. The benefits of cost-sharing arrangements for the delivery of programs and services and the development of infrastructure were noted (improved service delivery and the elimination of duplication in service provision) however, the increased workload that comes along with this norm was also distinguished (AAMDC 2009a).

#### ***4.3.1.3.3 Vertical Networks***

Interviewees from Canmore and High Level discussed their relationships with higher-level decision-making bodies. These relationships were primarily described as being positive however some problems did emerge. Specifically, higher-level government processes and decision-making were occasionally found to act as barriers for community sovereignty and the realization of community-level collective goals. This is evidenced by what was said in the community sections where participants discussed their input into provincial-level decision-making. A large number of participants in both communities said that they have only indirect input into these processes and several questioned the effectiveness of that participation.

In High Level, the hierarchical nature of the provincial government system has led some people to feel like they are being ignored by provincial decision-makers. A few examples that were raised by participants related to the fact that High Level is often viewed as being a part of a region and when the province does consultation around issues like health or economic development High Level may be overlooked while input from larger centres such as Fort MacMurray is sought.

Occasionally, provincial processes have overridden local decision-making in Canmore as was the case with the development of the Community Sustainability Plan. Additionally, some comments referred to the prohibitive nature of provincially-dictated regulations. Some of these comments suggest that Canmore's governance culture and its sustainability paradigm don't always fit

with the dominant paradigm of the provincial government. The idea of putting limitations on development for environmental protection may defy the discourse of ecological modernization that is pervasive in provincial government. Davidson and MacKendrick (2004) argue that the emphasis in ecological modernization among Alberta's governance actors is on the expansion of development in combination with the use of technological and market-based solutions rather than on limits to or reductions of development. As ultimate authority over development decisions rests with the provincial government, the ability that Canmore has to determine the course of its economic development may actually be very limited.

A couple of interviewees from the provincial government said that their organizations prefer to give communities their autonomy rather than dictating local decision-making. These participants felt that their role is to provide information and resources to support local governance however the need to impose accountability was also mentioned.

“We actually try hard to stay out of community-level decision-making. ... We'll give them advice on process and we may route them to different information sources. ... but we don't want to get involved in decision-making” (Provincial Government, Alberta, December 2008)

How do we reach out and provide support for communities in the right way so that we're not seen as being overly aggressive, in terms of dictating what communities should do and how they should do it, but more the hand-on-the-shoulder approach?” (Provincial Government, Alberta, January 2009)

Many organizations in the communities of Canmore and High Level are members of larger associations that are meant to represent their interests in higher-level decision-making processes. For example, the Alberta Association of

Municipal Districts and Counties (AAMDC), the Alberta Rural Municipal Administrators' Association (ARMAA) and the Alberta Urban Municipalities Association (AUMA) represent municipal government interests at the table with various stakeholders including provincial government departments.

At the provincial level, interviewees from non-government organizations said that they have opportunities to provide input into state and multi-stakeholder decision-making. All five participants from NGOs said that they have positive and collaborative relationships with the provincial government. They said that their organizations have the ability to provide input into provincial decision-making either directly in consultation or indirectly through participation with multi-stakeholder committees.

“We’re seeing a little bit more recently that the government is being responsive and integrating our feedback to them into policies ... Again it depends on the issue but overall we have a fairly positive relationship. We don’t always see eye-to-eye but certainly on most of the projects where we’ve made a concerted effort to work together, it’s worked out” (NGO, Alberta, January 2009)

“We annually meet with Deputy Ministers from 8 of the departments that we have the most face-to-face activity with ... and we have a candid discussion on topics and quite often change has come from that process.” (NGO, Alberta, January 2009)

One participant raised a concern about the uneven representation of NGOs on multi-stakeholder committees. The participant said that industry representatives often lead these processes and there is representation from all the different types of industry but there is often only one seat that represents environmental interests. As well, the participant often felt uncomfortable being put in that role as she is a water expert but was not as experienced dealing with

wildlife issues or other non-water aspects of the environment. She also said that it is very challenging for NGOs to participate in these processes because they don't have the same amount of financial resources as private industry.

While this concern was only raised by one participant, there are indications that this may be a more widespread issue as there has been controversy over different multi-stakeholder processes in the province. For example, in 2008 three environmental organizations withdrew from the Cumulative Environmental Management Association (CEMA) a multi-stakeholder process meant to manage the environmental impacts of oil sands development in the Fort McMurray region. These groups claimed that the Government of Alberta was continuing to approve oil sands development projects in the absence of sufficient environmental management, that there had been a consistent failure to meet deadlines for recommending systems to protect the region's environment, and that both the oil sands industry and the government had been using the process as a shield to deflect criticism about the cumulative environmental impacts of oil sands development (Pembina Institute 2008).

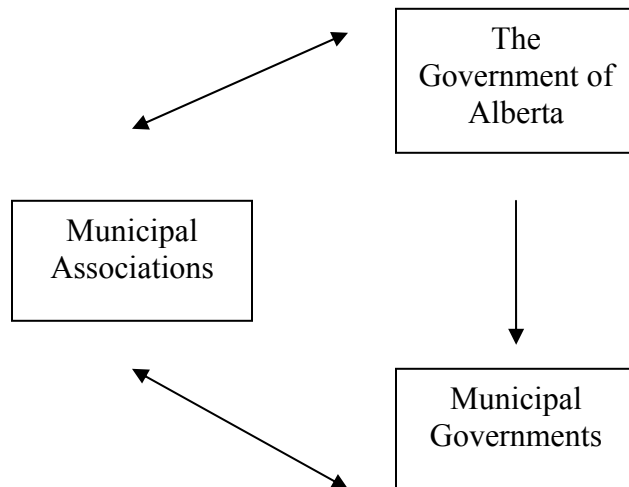
Provincial-level participants discussed their relationship with community level organizations and said that municipal staff from different localities regularly contact them to obtain information about various topics or to raise concerns that they feel should be addressed by the organization. They said that this connection with communities allowed them to identify which issues are important and how they affect rural communities in the province. For example, some participants talked about surveying their members periodically to gauge the extent of different

problems and then hosting events where community actors could have more in-depth discussion with their representatives. These connections also allowed many provincial-level organizations to provide communities with resources to deal with those issues and to implement programs to address them.

There was recognition within both municipal organizations and the provincial government that the relationship between the state and communities has traditionally been a paternalistic one. While government representatives expressed a desire to give communities increased autonomy, the general approach within government for dealing with communities appears to be one of universalism. Ties between the provincial government and individual communities may therefore be constrained as individual communities have only a limited influence on higher-level decision-making. As a result, funding and other types of support provided by the provincial government may be lacking in some cases. In the cases of High Level and Canmore, this seemed to occur because the population is low relative to other communities and because local initiatives conflict with provincial ideology.

Participant comments suggest that there is movement toward giving individual communities more autonomy and this is certainly advocated for by municipal organizations. The ties between state and provincial-level organizations representing municipal interests appear to be fairly strong. These organizations act as a united voice for individual communities within provincial governance and may have more of an influence on state policy and decision-making. They also filter information and resources down to communities and their relationship with

communities may compensate for the lack of direct interaction with the state allowing access to needed resources and facilitating collective action (see Figure 1 below).



**Figure 1 Higher-Level Networks of Municipal Governance**

#### ***4.3.1.3.4 Aboriginal Networks***

Issues regarding Aboriginal peoples only emerged in High Level. While there are First Nations reserves located in the region surrounding Canmore, the Aboriginal population in the community (1%) is much lower than in High Level (21%) (Statistics Canada 2006). Participants from Canmore did not mention Aboriginal organizations, and no Aboriginal or First Nations organizations appeared on the Town website or in Interagency meeting minutes. In High Level, issues with the institutional arrangements between Aboriginal and non-Aboriginal organizations involved in governance were evident. Several participants said that Aboriginal organizations and governments have limited input in community,



regional, and provincial decision-making processes. Comments suggest that perhaps distinct funding, consultation processes, and other governance institutions regarding Aboriginal groups inhibit the development of stronger partnerships and collaboration with other governance actors. Racism and class discrimination may also play a role in weak ties between governance organizations.

The federal government has primary responsibility to address the needs of the Aboriginal people of Canada and provides funding for many of the social services targeted for Aboriginals (INAC 2010). Canada's constitution recognizes Aboriginal peoples as unique, and Aboriginal and treaty rights are protected by the federal Constitution and other formal and legal agreements. On the other hand, provincial governments also have authority over many of the daily activities that affect Aboriginal well-being at the local level including resource use, transportation, and infrastructure. The provincial government's role in regards to Aboriginal people's well-being has been primarily related to the economic dimensions of consultation on resource development and Aboriginal economic participation. The relationship between Aboriginal peoples and the provincial government is therefore unique and much different from its relationships with municipal governments which fall primarily under provincial jurisdiction.

The relationship between Aboriginal people and the Government of Alberta has been evolving over the years towards a more strategic approach to formalizing relationships and fostering partnerships with Aboriginal communities (Young 2010). Given the socio-economic status of Aboriginal peoples review in section 4.2.2.5.1 however, it appears there is still much effort needed to address

disparities between Aboriginal and non-Aboriginal peoples in the province. Additionally, provincial and federal governments need to begin to treat Aboriginal governments as equal partners in decision-making, especially environmental decision-making, rather than as stakeholders that need to be consulted. This would be particularly true in regards to climate change decision-making which has thus far failed to include Aboriginal peoples in governance processes (CIER 2006).

These challenges are problematic given that Aboriginal peoples are considered to be particularly sensitive to changes in the environment because of the importance of harvesting activities and exposure to climate changes (Ford et al. 2006). The reduced socio-economic status of Aboriginal people in the High Level region, their increased sensitivity and their isolation from community networks mean that they may be even more vulnerable to climate change issues and have even fewer resources for adaptation. Climate change thus has the potential to make an already marginalized group more vulnerable (Adger 2003).

#### ***4.3.1.3.5 Non-permanent Residents***

A factor that poses challenges for governance in both Canmore and High Level was the presence of non-permanent residents. Both communities have a high proportion (about one third of the total population) of non-permanent residents that stay in the community for a variable length of time, albeit for different reasons. The effect that this type of population has on social cohesion in the study communities is similar as neither group appears to be engaged in

community governance. The presence of non-permanent groups was also found to be contributing to existing social problems in both communities. Specifically, the growth of the non-permanent population in Canmore is associated with development tailored to the tourism industry that is sometimes at odds with the community's emphasis on environmental protection. This growth has also contributed to socio-economic problems like the lack of affordable housing, the loss of families, and a declining base of permanent residents. High Level has contrastingly had difficulties engaging residents in collective action. The funding allocated for municipal services by the provincial government was also said to not reflect the additional service needs of non-permanent residents in both communities.

Although it is difficult to get information about non-permanent residents in Alberta, the limited data available suggests that this may be a growing problem because migration into the province is on the rise. Both the rates of in-migration into Alberta from different countries and provinces and intra-province migration (migration within the province) have been growing at a substantial pace. From 2002 to 2006, Alberta had the highest growth rate when compared with all other provinces and territories in Canada (Alberta Education 2009). This trend continued in 2009 with Alberta receiving a net inflow of 15, 945 people (Alberta Finance and Enterprise 2009). According to the 2006 census, intra-provincial movement is also very high in Alberta with 127,915 persons moving within the province to another census area in the preceding one to five years (Statistics Canada 2006).

Given the high rates of migration into, out of, and around Alberta, the implications of having a high proportion of non-permanent residents likely plague both rural and urban municipalities in the province. The circulation of non-permanent residents into and out of communities for work and for leisure does not appear to be conducive to the development of bonding or networking social capital in either Canmore or High Level. The limited engagement of non-permanent-resident groups in their community of temporary residence and the lack of social cohesion that are felt between this group and the rest of the community may also limit the collective sense of responsibility for social and environmental issues and constraint the development of social capital overall. This may also restrict cooperative behaviour in future times of strain.

#### **4.3.1.4 Cultural Capital**

##### ***4.3.1.4.1 General Environmental Beliefs***

Community culture as it relates to the environment is quite different in High Level and Canmore. Environmental stewardship is a guiding principle in Canmore and there is a collective sense of responsibility toward the environment. The sustainability paradigm that dominates the culture of governance places emphasis on a balance between environmental, economic, and social values. In High Level economic concerns continue to dominate governance and there appears to be limited concern about environment issues.

Environmental discourse in High Level was also found to reflect a more anthropocentric view of human-environmental linkages than the ecocentric

discourse prominent in Canmore (Eckersley 1992). Communities with a more eco-centric culture towards human-environmental linkages may be more likely to implement policies that limit the impact of human behaviour on the environment than communities with an anthropocentric culture or those that do not value environmental protection. As was seen in High Level however, it is possible to garner support for environmental initiatives or to implement policies that address environmental concerns in communities that have a more anthropocentric orientation if the project also appeals to other values such as economic savings.

The differences in governance culture between the two study communities suggest that there is likely to be a variety of governance cultures in existence across communities in the province. The provision of financial incentives for projects and planning that address sustainability, as is the case with the Government of Alberta's Municipal Sustainability Initiative, thus have the potential to engage a broader range of communities into these types of activities. However, the provincial government may need to take a more-flexible approach with communities engaging in innovative approaches to sustainability such as Canmore. Because authority for many decisions remains with the Province, governance actors in Canmore are constrained in policy flexibility and their ability to achieve success with novel policies.

#### ***4.3.1.4.2 Climate Change***

Climate change appears to be more of a concern in Canmore than in High Level. While there were a variety of opinions about climate change beliefs in

Canmore, many organizations are engaged in activities to address the issues. The importance of climate change within different organizations varied from being a central part of organizational mandates to being a very minimal point of interest. In particular, environmental organizations seemed to place a higher priority on addressing climate change. The lack of recognition within the Town of Canmore that policies aimed at reducing GHG emissions were linked to climate change is problematic because of the central role that this organization plays in community governance. This lack of institutional memory leaves room for non-accountability and ineffectiveness, and also limits the ability of this organization to learn from past management experiences, which is believed to be a key facet of climate change resilience (Tompkins and Adger 2004).

Climate change does not appear to be a priority concern in High Level. Participants said that most people in the community were not very concerned about it and there were only peripheral references made to climate change in governance documents and policies.

Overall, the majority of interview participants were aware of the hazards that are predicted to impact the province including weather extremes, drought, water shortages, and the Mountain Pine Beetle infestation. Many could also identify the potential damage that these impacts could have on the socio-economic and environmental conditions in their communities or the province more generally. However many interview participants confused the causes of climate change, its link to global warming, and the differences between adaptation and mitigation. For instance, during several interviews participants answered

questions about adaptation with regards to mitigation. There implies that there is a need for more communication of climate change information.

“We’re working on summary documents and fact sheets and that sort of thing to boil that information down to stuff that’s more accessible by the general public. We’re not going to throw a 200 page report in front of somebody; it’s not really useful. So we’re looking at developing some educational materials incorporation with this strategy discussion”  
(Provincial Government, Alberta, January 2009)

Some other discussion about why action on climate change is limited did occur. One potential limitation was the common perception that many people don’t believe in climate change. Only one interview participant actually said that he did not believe that climate change was real, but many identified persons other than themselves whom they said do not believe in climate change.

“You have the people who are really proactive. we have counties that are doing everything they can in terms of micro-generation to green energy production, [and] everything in-between to green their fleets. And then you have the ones who tell you that climate change is a lie. So there’s a big, big variety, a vast array of what our members think is going on.”  
(NGO, Alberta, February 2009)

“Although the polls are saying that there’s more and more people that are concerned ... I don’t know that our political level is strongly engaged in doing the adaptation thing. I do know that there are a number of MLAs that don’t believe in it. And that’s out there. We’ve got people that still say that climate change is something that we don’t have to worry about. And that concerns me when those people are in positions of authority and they’re leading. So I don’t have a good feel for what the real grassroots people in Alberta think about it. It’s seems to be somewhat of a tough issue to get on the agenda at this point although I think it’s getting there. (Provincial Government, Alberta, January 2009)

Four participants thought that there are increasingly more people who believe in climate change and that the number of initiatives being implemented is on the rise. Others said that despite those that don’t believe they were able to garner

support for climate change projects by focusing on energy efficiency or resource savings.

Several participants also said that even when people do believe that climate change is real and understand that action needs to be taken, other concerns often have priority. This was especially said to be the case for organizations or communities where the time, funding or other capital available to deal with a variety of concerns is limited. Addressing climate change was thus not thought to be a priority for small rural communities in particular.

“It probably isn’t at the top of the priority list for these small communities because they are, in many cases, struggling to get by day-by-day and you tend to focus on things that are a little bit more immediate than things like climate change, that has major implications but you don’t necessarily see the results right away... the constraint is not so much getting past that mind set, the constraint is yes that’s 14<sup>th</sup> on my list and I’ll get to it when I can.” (Provincial Government, Alberta, December 2008)

Another potential reason that emerged as to why there is limited action on climate change was a lack of awareness or understanding on how to take action. Participants said that among those people who believe that climate change is real and see it as a priority, there is limited understanding of how to integrate climate change into decision-making. This was said to be a reflection of the nature of climate change in terms of uncertainty and complexity, and the subsequent governance challenges associated with management under these conditions. Additionally, a couple of participants noted that the sheer amount of information available regarding climate change was often overwhelming.

“That’s the whole problem with this issue is that there’s not “okay we’re gonna get this climate scenario by 2015, we need to plan for it.” It’s not that. Its understanding where we might be and working our way to it as



things develop. Which is a different way of thinking and that's what we need to, in our decision-making that needs to be reflected as well. Not saying "here's the trend, historically it's this way, this is what we're going to do." It's different; it's learning how to think in a different way." (Provincial government, Alberta, January 2009)

Despite these constraints, many communities and organizations are taking the lead in addressing climate change. In particular, community and provincial environmental organizations that have a mandate focused on sustainability and environmental issues appear to be experimenting with and implementing a variety of programs that address the issue as well as conducting research and advocating for greater action in diverse areas of governance. Municipal associations have also been doing a lot to address climate change. The Alberta Association of Municipal Districts and Counties (AAMDC) and the Alberta Urban Municipalities Association (AUMA), in cooperation with Alberta Environment, have conducted environmental scans to identify the common constraints that municipalities have in implementing plans and programs to address climate change. They subsequently developed the Municipal Climate Change Action Plan which seeks to develop municipal capacity to mitigate GHG emissions. There are also significant research activities being undertaken by both private and public organizations in the province.

These activities are helping to build adaptive capacity through innovation, experimentation, and knowledge creation, which is being shared through social networks. For instance, the establishment of Climate Change Central in 1999 and the Municipal Climate Change Action Centre in 2010 will help to direct research into practical applications and proliferate innovative practices.

Many of the activities being undertaken have been supported by the provincial government through funding programs and other types of assistance. There also appears to be a variable level of action occurring within the provincial government including internal capacity building and the integration of climate change concerns into key areas like water management, emergency response, agriculture, as well as municipal infrastructure funding. For example, Alberta Agriculture and Rural Development has developed dozens of factsheets about GHG emissions, climate change, and links with different agricultural practices. They also have initiatives to quantify offset investments, research the links between climate change and agriculture, and present information to the public (Alberta Agriculture and Rural Development 2010).

It is not entirely clear however how research is being integrated into policies and management. While many of these departments are conducting research or supporting research initiatives and providing information to the public, the majority do not have adaptation plans in place.

“The forest industry right now is so concerned about survival but I don’t think they’re looking significantly ahead at what they have to do in their management plans. SRD (Sustainable Resource Development), for example, hasn’t made significant changes to their management plan requirements to have climate change being addressed from the start of the planning process. So they need that. There’s people thinking about it but really translating that into direction that says in your management plan you need to be modeling these kinds of things and understanding fire rates and regeneration rates under different climate regimes and what that does to your sustainability. That isn’t really there yet so that’s the kind of thing that we really have to happen to start to change management and that but I don’t see it out there yet.” (Provincial Government, Alberta, January 2009)

“As part of our capacity building exercise that we did last year, we did an interview process across all of our Ministries that are involved with

the Climate Change Adaptation Team. And it was really quite interesting, the level of knowledge that was there and what wasn't there. Some areas were quite on top of it and understood where they fit and some places where you would expect a fair amount of knowledge, it wasn't there. And that was enlightening ... there was some [departments] where I would expect that the signals should have been right in front of them. And they should have been there and they're starting to think about this issue seriously and basically they weren't there at all. And yet others could see potential out there and had some ideas about how they might start to deal with it. Nobody was really taking a lot of action yet." (Provincial Government, Alberta, January 2009)

In 2008, after consulting with the public as well as climate change experts, the Alberta Government released their current Climate Change Strategy. The provincial government perceived a desire amongst the public to address climate change however the focus has remained predominantly on mitigation. The plan has three main thrusts; energy efficiency, carbon capture and storage, and greening energy production. The goals are to reduce emissions 20 mega tonnes by 2010, 50 mega tonnes by 2020 and by 200 mega tonnes by 2050 (Alberta Environment 2008). Several participants mentioned that a provincial economy based on fossil-fuel extraction is a disincentive for decisive action on climate change. Others said that the provincial government's technological approach to the management of environmental problems were problematic for effective climate change mitigation.

"There has been a shift in Alberta and many of the other western provinces toward environmental assurance which is that you approve development and then the Environment Department's job is to make sure that whatever happens there is done with a minimum impact on the environment. Now a classic example of that is in the oil sands where approvals were given with the proviso that water treatment technology would emerge in time to deal with the water issues ... that technology has yet to emerge and that's why we've got 50 square kilometers of heavily-toxic contaminated water that we don't know how to manage.

Now we're doing that with carbon capture and sequestration. We're promising to do that even though the technology is at least a decade away and imperfect" (NGO, Canmore, November 2008)

The province's climate change strategy does refer to adaptation, albeit briefly. The main action listed regarding adaptation is to develop a provincial adaptation strategy, which a handful of participants said they were currently participating in. As it stands currently however, adaptation and mitigation need to be combined more effectively and there is a need for more widespread inclusion of climate change in governance planning overall (Hubert, Corkal, and Diaz 2009).

"If you've read our 2008 strategy, adaptation is a page in there. It's not really mentioned as one of the key thrusts of the strategy; it just kind of fits there. ... we certainly encouraged them to try and make it a stronger piece when we started off in discussions on that strategy. We said we should have 2 main thrusts; mitigation and adaptation ... And instead they chose to have 3 main actions on mitigation and kind of dropped adaptation in on the side, which doesn't give you the strength to move ahead with it. But certainly we're not there in terms of the amount of money spent on adaptation at this point. Our provincial government is spending peanuts compared to places like Quebec which is spending \$93 million ... So you just think about that difference in scale and understanding in terms of the ideas; huge differences." (Provincial Government, Alberta, January 2009)

There also appears to be a lot of confusion or mixed beliefs about who is responsible for addressing adaptation to the impacts of climate change.

Participants expressed different views of the roles that various actors should play in addressing climate change impacts including their own organizations. There is therefore a need for discussion around adaptation responsibility amongst all governance actors.

#### ***4.4 Summary of Findings***

Several of the dominant themes that emerged from the comparison of the two study communities were financial, human, social, and cultural capital constraints (see Table 3 below). Although the depiction of some resources as capital is argued to be contentious, it allowed for easier discussion and organization of the findings. It should be noted however, that participants talked about capital resources in different ways. Resources traditionally considered capital (i.e., financial and human capital) were discussed as such, while social and cultural capitals were discussed as relationships and culture.

**Table 3 Main Themes in Canmore and High Level**

Theme	Canmore	High Level
Financial Capital	<p>Municipal funding does not reflect high non-permanent population</p> <p>Unsustainable growth in tourism driving local development</p>	<p>Municipal funding does not reflect non-permanent workforce</p> <p>Economic downturn contributing to lack of local employment</p>
Social Capital	<p>Consensus-based and collaborative governance</p> <p>Strong community networks</p> <p>Weak vertical networks</p> <p>Regional networks present</p>	<p>Lack of engagement in addressing community issues</p> <p>Weak community networks, particularly with Aboriginal organizations</p> <p>Weak vertical networks</p> <p>Regional networks present</p>
Human Capital	<p>High educational attainment</p> <p>Sustainability knowledge and skills exist</p> <p>Climate change knowledge gained through education</p>	<p>Low educational attainment</p> <p>Environmental skills predominantly extractive</p> <p>Media only source of information about climate change</p>
Cultural Capital	<p>Emphasis on balanced environmental, social, and economic values</p> <p>Eco-centric beliefs</p> <p>Culture of Sustainability</p> <p>Climate change an explicit concern for some organizations</p> <p>Climate change education and programs occurring</p>	<p>Dominance of economic values</p> <p>Anthropocentric beliefs</p> <p>Extractive Culture</p> <p>Little concern about climate change</p> <p>No action being taken to address climate change</p>

## 5 Discussion

As was described in section 2.6 an ideal institutional type for adaptation has the following characteristics (based on Agrawal 2008):

- Simple and easy to understand rules
- Clear and acceptable sanctioning mechanisms
- Available adjudication
- Accountable decision-making
- Mechanisms to encourage cooperation, promote collaboration and networked approaches to problem-solving
- Inclusive to all parties
- Allocates financial and other resources toward mitigation and adaptation
- Draws on local human capital to address climate change and other issues
- Reflects the belief that climate change must be addressed
- Positions climate change as a central consideration in community decision-making

Several institutional features bode well for Canmore's adaptive capacity. Collaborative governance that utilizes and facilitates strong organizational networks between a variety of stakeholders provides access to a broader knowledge base and allows more to be accomplished than would be possible otherwise. A sustainability paradigm that promotes the consideration of environmental issues in decision-making supports the development of innovative policies. Accessing outside expertise as well as integrating sustainability and climate change knowledge held within the community facilitates the development of sustainable practices and policies that can reduce the environmental impacts and better position the community to address the impacts of climate change. Some resources are being allocated toward the mitigation of GHG emissions that contribute to climate change however more accountability is needed in achieving results to ensure that social and institutional learning occurs within governance.

Allocating some resources toward the investigation of potential climate change impacts on the community and the development of a climate change adaptation plan would serve to build capacity. Overall, Canmore appears to have strong institutional capacity to adapt to the impacts of climate change.

In contrast, various institutional features of community governance in High Level indicate that institutional capacity is limited. Inter-agency meetings do encourage cooperation and networked ways of addressing community challenges however the inability to engage citizens and the exclusion of First Nations and Aboriginal organizations from community governance, be it purposeful or unintended, undermines High Level's capacity to address community challenges. This exclusion not only limits Aboriginal peoples' ability to provide input into decision-making and act collectively in their own interest, but it also means that their human capital and the experience of non-engaged citizens are not being utilized to attend to community challenges. The participants interviewed from a First Nations organization were one of the only ones from the community to express concerns about climate change which highlights why more inclusive governance is needed. In particular the operation of traditional ecological knowledge in governance may provide some insight into the impacts that climate change will have for the community. As it stands, considerations of climate change have not entered into community decision-making and environmental considerations have primarily been overcome by economic factors. The dominant anthropocentric perspective and value placed on economic considerations suggest that there may be resistance to adaptation especially towards adaptive actions that



require financial investment. These challenges indicate that governance institutions in High Level require serious work to build up adaptive capacity.

Despite the unique contexts of the two study communities, there are a number of institutional factors that were commonly challenging for adaptive capacity. To begin with, there are general financial and human resource constraints that exist in both communities. High Level, in all likelihood, has less financial resources at its disposal to deal with current and future community stress given the smaller size of the community and lower property values. Lower educational attainment and isolation are additionally problematic. In contrast, greater educational attainment and the existence of sustainability and climate change experience position Canmore as being more capable of addressing environmental and climate change challenges.

Participant comments and secondary data sources suggest that financial and human capital constraints are indeed more extensive for smaller rural communities in Alberta. The current funding system for municipalities is problematic in that it doubly disadvantages these smaller communities. The amount of funding to which a community is entitled is tied to population yet the economies of scale for the provision of core services and infrastructure simply aren't there for many smaller communities. The ability to apply for funding and meet arduous reporting requirements is also a challenge for smaller communities where human capital is already constrained. The system is additionally challenging because of its reliance on property taxes that do not have built-in mechanisms to respond to population and economic growth (Ploeg 2008).

Increased disparity between larger and smaller communities and dependence on government transfers for operating capital seem to indicate amplified vulnerability to climate change as the resources needed for coping within smaller towns are limited (Kelly and Adger 1999). Indeed, two separate environmental scans of municipalities in the province found that a few of the larger communities and all of the small communities that were surveyed identified financial limitations and costs as a barrier to implementing climate change plans and programs (AUMA 2008; AAMDC 2009b).

Changes to the current assessment and taxation systems could ease the burden put on communities however community restructuring or dissolution may need to occur when long-term community viability is not possible (AUMA 2007a). Alternatively, new funding mechanisms and the diversification of funding sources available to municipalities may also provide additional financial capital that can increase community capacity. There have been several attempts to propose alternative funding mechanisms for municipalities in the province. This includes a 2007 proposal by municipal leaders for municipalities to collect user fees from those using community services in order to reduce the tax burden on homeowners. This mechanism could also potentially address funding challenges related to non-permanent populations.

Another attempt occurred in 2009, when an MLA from Edmonton-Centre, Laurie Blakeman, introduced for First Reading in the Legislative Assembly of Alberta Bill 204; the Provincial-Municipal Tax Sharing Act (Blakeman 2009). The bill called for the provincial government to enter into a revenue-sharing

arrangement whereby municipalities would collect 2.5 percent of income tax revenues. However, the bill was defeated. The Federation of Canadian Municipalities has also been calling for the development of a national plan to deliver sustained long-term funding for rural communities in Canada. They argue that there is a need to transition away from the traditional boom and bust cycles of economic development that are prevalent in rural Canada (FCM 2009). Funding mechanisms that are tailored to individual community needs and that recognize the limited capacity of some communities are likely to be more beneficial than a blanket system that is based on the assumption of equal capacity.

Another way in which rural communities may be able to alleviate financial and human capital constraints is through municipal restructuring or shared service provision. The adoption of service sharing agreements or “networked governance” appears to be the norm for municipalities in Alberta. It should be noted that some small rural communities may not have the time or resources available to participate in these types of relationships and some will not have the social capital basis to benefit from this norm. While universal incentives may incite some communities to enter into these relationships, a different approach is needed to assist communities that do not currently have the capacity to do so. This could involve a more tailored mechanism that identifies communities with limited social capital on a community-by-community basis and provides assistance for the development of social capital in ways that fit with the context of community needs.

Differences between the levels of social capital within the study communities are illustrative of this. By and large, the majority of relationships between different organizations within communities and with provincial-level organizations were positive; however social capital in Canmore appears to be greater than in High Level where community engagement is lacking and Aboriginal governance is disconnected from community decision-making.

These factors appear to be a barrier for the development and operation of social capital in addressing challenges collectively including climate change. The engagement of organizations was higher in Canmore as was the collective sense of responsibility for social and environmental issues. These factors contribute positively to Canmore's adaptive capacity as they have the potential to help the community deal with other stresses and may help to absorb some the impacts of climate change.

Certain individuals within the community of High Level have attempted to mobilize social capital to address background stressors such as poverty, community engagement, and economic decline, but thus far they have only achieved minimal success. Attempts to reduce background stress in High Level have included the establishment of various committees on arts and culture, recreation, sport and leisure, education, social services, health and economic development. Participants however, said that limited community engagement and strained relationships were constraints on more effective collective efforts to address these issues. These constraints on social capital will constrain the ability

of High Level to successfully deal with the impacts of climate change due to the limited capacity to act collectively.

The division between Aboriginal and non-Aboriginal organizations in the High Level region limits the access of Aboriginal groups to horizontal and vertical networks. Limited collaboration between these organizations, their restricted interaction and strained relationships impede participation in greater cooperative action on common issues of concern. This separation prevents the development of bridging ties that can support the sharing of important knowledge and resources between governance networks in the region (Warner 2001). For example, indigenous communities have been shown to have extensive knowledge about their traditional lands that is particularly important to discussions of climate change (Ermine et al. 2008). Therefore the integration of indigenous knowledge into the development of mitigation and adaptation strategies has the potential to reduce vulnerability significantly (Nyong, Adesina, and Elasha 2007).

The engagement of Aboriginal organizations in community governance networks consequently represents a potentially huge improvement for the ability to act collectively; particularly in regards to climate change but also when attempting to address other community concerns in High Level such as “the street people.” The challenges that need to be addressed to achieve greater collaboration are separate funding and governance mechanisms (at the provincial level) and racial/class divisions (at the community level) that prevent Aboriginal people from being seen as members of the community.

Generally speaking, increased regional governance may allow communities to strengthen their ties with other groups of people facing similar issues of concern. It may also facilitate the sharing of resources and has the potential to give communities more power in negotiating and consulting with the provincial government. Participation in regional networks thus has the potential to contribute positively to social capital and to adaptive capacity. Encouragement by the government and other governance actors to work together and pool resources also has the potential to build adaptive capacity. It must be noted however that there are challenges involved with increased collaboration including normative differences that can cause conflict between organizations and increased effort and time burdens. Strategies to help alleviate some of the stresses on already stretched service provision, and to overcome divisions between different groups need to be developed to reap the full benefits of these relationships. Currently, the government and several of the municipal association offer toolkits to guide the development of collaborative partnerships and dispute resolution.

These findings suggest that social capital plays a key role in adaptive capacity and that communities with stronger social ties will have more capacity to adapt to challenges successfully. The ability of communities to act collectively in regards to background stressors is also potentially similar to their ability to deal with the impacts of climate change. Thus the development of social capital will be a key factor for building the adaptive capacity of communities like High Level.

The need for increased social capacity in rural communities across Alberta is already recognized (AUMA 2007b). There are currently a myriad of programs

that are supported by the provincial government and different municipal associations that are meant to build leadership, strengthen community cohesion and contribute to the development of rural social capital. These include programs aimed at providing opportunities for rural youth, engaging and supporting seniors, encouraging participation of Aboriginal peoples and building general community capacity (Alberta Agriculture and Rural Development 2009). The need for increased inter- and intra-governmental cooperation as well as inter-sectoral collaboration to contribute to the development of social capital is also documented (AUMA 2007b).

The cultural capital institutionalized in governance was found to be a significant factor for governance in both communities. Governance structures in both High Level and Canmore were found to particular values, beliefs, and perspectives that guide decisions about how resources are used and for what. In Canmore, a paradigm of sustainability has been operationalized within governance and corresponds with the implementation of policies and programs aimed at reducing the environmental impacts of the community and integrating environmental values into governance decision-making. Climate change is a top priority for several organizations, though not all, and there are programs and initiatives in place that aim to address climate change and other environmental challenges. These findings reflect the eco-centric beliefs that have become institutionalized in governance and demonstrate the increasing importance placed on addressing climate change. The recognition that social and ecological systems have feedback systems that ultimately position humans as a part of nature is

indeed the basis of adaptive governance (Berkes and Folke 1998; Folke, Hahn, Olsson, and Norberg 2005). The type of cultural capital valued within Canmore's governance institutions thus appears to contribute positively to its adaptive capacity. The institutionalization of this sustainability perspective has also involved innovation and experimentation with new policies and perspectives and collaboration and power-sharing that have likely already contributed to the development of adaptive capacity in Canmore (Argawal 2008). As a result there may also be more willingness within governance and the community to take on adaptive responses given this cultural perspective.

In High Level it seems that an extractive culture exists perhaps due to the role that the community plays in extractive natural resource industries. Environmental issues including climate change do not seem to be a big concern in the community and governance institutions do not reflect any value placed on address climate change yet. The dominance of economic values does not facilitate behavioural or policy change to address climate change but it does not necessarily exclude it either. These anthropocentric environmental values that are institutionalized in governance thus appear to constrain the ability of High Level to be prepared for the impacts of climate change.

The absence of environmental organizations in High Level and issues with informal networks limit the amount of awareness being brought to the area about the potential impacts of climate change. Institutional change is argued to occur through processes of social learning to which informal networks are crucial (Pahl-Wostl 2009). Informal exchanges of ideas can provide access to new kinds of



knowledge and exposure to different interpretations of complex problems in a way that allows for innovation and potentially the development of adaptive capacity. The development of social capital can thus contribute to adaptive capacity by allowing for more exposure to information but there is also a need for collective efforts to be focused on addressing climate change issues and guided by environmental considerations. The province's Municipal Sustainability Initiative has the potential to facilitate the development of social capital because it provides a financial incentive to engage in partnerships and planning. However, it could stimulate further development of adaptive capacity by encouraging a commitment to the integration of environmental considerations into governance. Along with the provision of planning aides that support this endeavour, it can help to facilitate greater social learning and potentially more sustainable development.

There will also need to be significant planning occurring at the provincial level in order to prepare communities for climate change. This planning should take culture into consideration in policy and programming. In order to engage communities across the province in proactive adaptation, provincial organizations will need to take a variety of different institutional contexts into account, including fluctuating capital resources, values and beliefs, and organizational arrangements. While some communities may now be able to recognize the potential risks of climate change impacts on their community and act on them, there are still many factors that have the potential pose a barrier to successful adaptation. Some additional actions that the provincial government could take to help increase the adaptive capacity of rural communities include providing

relevant information about how climate change is likely to affect the local environment, economy and social situations in which communities find themselves. To generate action, messages about climate change need to appeal to people with different values and beliefs. Messages that include economic, environmental and social benefits of action are likely to be more successful because they appeal to people with divergent value orientations. Information that is personally relevant and practical will also support behavioural changes (Adger et al. 2007).

In addition, mechanisms that address institutional constraints on collaborative planning are needed. Flexibility, innovation and autonomy in decision-making should be encouraged (Johnson et al. 2010). Provincial organizations could also provide assistance with monitoring, planning, and adaptation by providing access to experts, planning tools, and funding. Structured climate change scenarios for example, may facilitate resilience and adaptive management (Folke et al. 2002).

There appears to be some attention being paid to adaptation at the higher level. Much of the effort is being put into research and knowledge dissemination as well as the integration of climate change concerns into projects in key areas of governance. For example, the provincial government created a new emergency response agency and is developing adaptation strategies with emphasis on building capacity within and outside of government. NGOs are showing innovation and leadership by questioning old governance assumptions and championing new goals for development and sustainability. However clarification

of goals and responsibilities is still needed. It has also been suggested that adaptation planning is most effective when it is aligned with development goals and with the principles of sustainable development (Adger 2001; Adger et al. 2003; Klein et al. 2007).

Future research could also contribute to adaptation efforts by exploring some of the key gaps in knowledge. It could investigate what happens to unviable communities and what dissolution means for the people living in these communities. The appropriateness of alternative funding mechanisms to address climate change could also be explored.

The research questions that were the basis for this study (as stated in Chapter 1, section 1.2) are; 1) what are the regulative, normative, and cultural-cognitive governance contexts of the two study communities? 2) what are the symbolic systems, cognitive scripts, and moral templates that structure local governance? 3) how do governance institutions structure understanding of climate change within the community and influence decision-making about the appropriate ways to address the impacts of climate change? 4) what kind of repercussions do governance institutions have for adaptive capacity?

The research responded to question one by highlighting the institutional nuisances of community governance in Canmore and High Level as summarized in Table 3. In regards to questions two and three, the findings presented in section 4.3.1.4 in particular highlight the role that general environmental beliefs as well as perspectives on climate change held within both community and broader provincial-level governance play in structuring understanding and action on

climate change. In Canmore, eco-centric beliefs and a sustainability paradigm have led to the development of policies and programs that encourage citizens and organizations to engage in behaviours and planning that can minimize environmental impacts (including contributions to climate change) and provide space for the integration environmental and climate change considerations in decision-making. Although climate change issues do not appear to have infiltrated community governance in High Level, the institutionalization of anthropocentric beliefs and the dominance of economic values in decision-making suggest that climate change issues and future attempts to address mitigation and adaptation will be considered in terms of their economic importance.

In response to question four, this study draws attention to several repercussions that governance institutions at the community level have for adaptive capacity. See the above section for details. Several features of the governance institutions operating at higher-levels have also been assessed in terms of their impacts as well. Specifically, provincial funding mechanisms appear to disadvantage communities with non-permanent populations and smaller communities that may not have the capacity to apply for additional funding and are already struggling to carry out daily functions. This limits the resources available for communities to address background stress as well as new challenges. However, funding incentives are provided for collaboration and regional governance with promotes the development and utilization of social capital and contributes positively to adaptive capacity. Additional assistance could be provided that supports sustainability (including environmental) and climate change planning through

access to funding and expertise more specifically targeted at these issues, particularly for smaller communities that may not perceive the risks or have the capacity to address it themselves. The provincial government could strengthen their relationship with individual communities by engaging in a more direct relationship with them as well as having more flexibility in decision-making and their treatment of communities in order to support innovation and to build adaptive capacity at the community level. The establishment of organizations meant to disseminate climate change information and resources contributes positively to adaptive capacity, especially those organizations meant to help municipalities in particular. Additionally, the development of an adaptation plan for municipalities across the province will better prepare communities and help them to understand how to address climate change impacts in governance. A broader provincial adaptation plan across government could further position climate change more centrally in decision-making across departments that play a role in community adaptive capacity.

### **5.1 *Conclusions***

Understanding institutions is central to our understanding of how environmental risks will be addressed by society. Research has shown that institutions do adapt to these risks and that this adaptation can reduce the negative impacts of environmental change given the right conditions (Adger 2006). Additional institutional research on environmental risks can increase understanding of how policy is implemented and how context matters in management (Lamb 2007). Institutional analysis can therefore be quite valuable

when it aims to identify institutional changes and strategies that could help encourage positive social change and overcome the barriers that inhibit adaptation (Ingram et al. 1984). The findings of this research suggest that worldviews and values play an important role in community governance in terms of social, economic, and environmental decision-making. This finding underscores the importance of taking normative environmental beliefs as well as worldviews and culture into account when assessing adaptive capacity.

Overall, this study highlights some institutional features that are important to adaptive capacity in communities in rural Albertan. It draws attention to several key areas where improvements in institutional arrangements and governance rules could be made in order to enhance communities' ability to deal with climate change. It appears that smaller rural communities face more significant financial and human capital challenges however the key issues to overcome them rest in social networks and local culture. These communities appear to require extra assistance to incorporate climate change adaptation into planning and governance.

## **6 References**

- Adger, W.N. 1998. Observing Institutional Adaptation to Global Environmental Change: Theory and Case Study from Vietnam. Working Paper GEC 98-21. *Centre for Social and Economic Research on the Global Environment*, University Of East Anglia, Norwich, and University College London.
- Adger, W.N. 1999. Social Vulnerability to Climate Change and Extremes in Coastal Vietnam. *World Development* 27(2): 249-269.

- Adger, W.N. 2000. Institutional Adaptation to Environmental Risk under the Transition in Vietnam, *Annals of the Association of American Geographers* 90(4): 738-758.
- Adger, W.N. 2001. Scales of Governance and Environmental Justice for Adaptation and Mitigation of Climate Change. *Journal of International Development* 13(7): 921-931.
- Adger, W.N. 2003. Social Capital, Collective Action and Adaptation to Climate Change. *Economic Geography* 79(4): 387-404.
- Adger, W.N. 2006. Vulnerability. *Global Environmental Change* 16: 268-281.
- Adger, W.N., S. Agrawala, M.M.Q. Mirza, C. Conde, K.L. O'Brien, J. Pulhin, R. Pulwarty, B. Smit, and K. Takahashi. 2007. Assessment of Adaptation Practices, Options, Constraints and Capacity. In: M.L. Parry, O.F. Canziani, J.P. Palutikof, C.E. Hanson, P.J. Van Der Linden (Eds.) *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Pp. 719-743.
- Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press: Cambridge.
- Adger, W.N., T.A. Benjaminsen, K. Brown, and H. Svarstad. 2001. Advancing a Political Ecology of Global Environmental Discourse. *Development and Change* 32: 681-715.
- Adger, W.N., K. Brown, J. Fairbrass, A. Jordan, J. Paavola, S. Rosendo, and G. Seyfang. 2003. Governance for Sustainability: Towards A 'Thick'

Analysis of Environmental Decisionmaking. *Environment and Planning A* 35:1095-1110.

Adger, W.N., T.P. Hughes, C. Folke, S.R. Carpenter, and J. Rockström. 2005. Social-Ecological Resilience to Coastal Disasters, *Science* 309(5737): 1036–1039.

Adger, W.N. and P.M. Kelly. 1999. Social Vulnerability to Climate Change and the Architecture of Entitlements, *Mitigation and Adaptation Strategies for Global Change* 4: 253-266.

Alberta Agriculture and Rural Development. 2009. Alberta's Rural Development Strategy 2009 Update. Available at:

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/csi12922](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/csi12922)

Alberta Agriculture and Rural Development. 2010. Climate Change and Agriculture. Available at:

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl9706#AAFRD](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl9706#AAFRD).

Alberta Association of Municipal Districts & Counties (AAMDC). 2009a.

Ensuring Alberta's Future: A Framework for Municipal Viability Through Community Sustainability. Position Paper. Available at:

<http://www.aamdc.com:8081/library/advocacy/publications/public%20reports/2009%20-%20municipal%20viability%20position%20paper.pdf>

Alberta Association of Municipal Districts & Counties (AAMDC). 2009b. Rural Municipal Action on Climate Change Environmental Scan. Available at:

<http://aamdc.com/content/blogcategory/191/447/>



Alberta Education. 2009. Continued Strength in Alberta's Population Growth. See

<http://education.alberta.ca/departments/ipr/commission/report/preparing/chgpop.aspx>

Alberta Environment. 2008. Climate Change Strategy. 2008. Available at:

<http://environment.alberta.ca/01757.html>

Alberta Finance and Enterprise. 2009. Alberta Population Report: First Quarter.

Available at

[http://www.finance.alberta.ca/aboutalberta/population\\_reports/2009\\_1stquarter.pdf](http://www.finance.alberta.ca/aboutalberta/population_reports/2009_1stquarter.pdf)

Alberta Finance and Statistics. 2008. 2007 Alberta Spatial Price Survey: A Place-To-Price Comparison Survey of Selected Alberta Communities. Available

at:

[http://www.alberta-canada.com/documents/spcs\\_pricecompsurv2007.pdf](http://www.alberta-canada.com/documents/spcs_pricecompsurv2007.pdf)

Alberta Municipal Affairs. 2007. 2007 CAO Survey Final Report. Available at:

[http://www.municipalaffairs.alberta.ca/am\\_chief\\_administrative\\_officer\\_\(cao\)\\_surveys.cfm](http://www.municipalaffairs.alberta.ca/am_chief_administrative_officer_(cao)_surveys.cfm)

Alberta Municipal Affairs. 2009c. Municipal Grants. Available at:

[http://www.municipalaffairs.alberta.ca/mc\\_municipal\\_grants.cfm](http://www.municipalaffairs.alberta.ca/mc_municipal_grants.cfm)

Alberta Municipal Affairs. 2009a. Types of Municipalities in Alberta. Available

at:

[http://www.municipalaffairs.gov.ab.ca/am\\_types\\_of\\_municipalities\\_in\\_alberta.cfm](http://www.municipalaffairs.gov.ab.ca/am_types_of_municipalities_in_alberta.cfm)

Alberta Municipal Affairs. 2009b. Practice Summary for Canmore. Municipal Excellence Network! Available at:

[http://www.municipalaffairs.alberta.ca/mc\\_municipal\\_excellence.cfm](http://www.municipalaffairs.alberta.ca/mc_municipal_excellence.cfm)

Alberta Municipal Affairs. 2010a. Guide to Property Assessment and Taxation in Alberta. Available at:

[http://www.municipalaffairs.alberta.ca/documents/as/ab\\_guideptyassmt\\_fi\\_nrev.pdf](http://www.municipalaffairs.alberta.ca/documents/as/ab_guideptyassmt_fi_nrev.pdf)

Alberta Municipal Affairs. 2010b. Municipal Sustainability Initiative. Available at:

[http://municipalaffairs.alberta.ca/wp\\_municipal\\_sustainability\\_initiative.cfm](http://municipalaffairs.alberta.ca/wp_municipal_sustainability_initiative.cfm)

Alberta Urban Municipalities Association (AUMA). 2007a. Municipal Sustainability Initiative; Analysis and Recommendations. Available at:

[http://www.auma.ca/live/digitalassets/16/16946\\_msi\\_policy\\_paper\\_02222008.pdf](http://www.auma.ca/live/digitalassets/16/16946_msi_policy_paper_02222008.pdf)

Alberta Urban Municipalities Association (AUMA). 2007b. 2007 AUMA Policy Statement on Municipal and Social Infrastructure. Available at:

[http://www.auma.ca/live/digitalassets/9/9148\\_2007municipalandsocialinfrastructure.pdf](http://www.auma.ca/live/digitalassets/9/9148_2007municipalandsocialinfrastructure.pdf)

Alberta Urban Municipalities Association (AUMA). 2008. Urban Municipal Action on Climate Change Environmental Scan. Available at:

[http://www.auma.ca/live/digitalassets/21/21098\\_urban\\_municipal\\_action\\_on\\_climate\\_change\\_environmental\\_scan.pdf](http://www.auma.ca/live/digitalassets/21/21098_urban_municipal_action_on_climate_change_environmental_scan.pdf)

- Appendini, K. 2001. *De La Milpa A Los Tortibonos: La Restructuración De La Política Alimentaria En México (2da Edición)*. México, DF, Colegio De México. Pp. 259.
- Argawal, A. 2008. The Role of Local Institutions in Adaptation to Climate Change. Paper Presented to the Social Dimensions of Climate Change, Social Development Department of The World Bank.
- Barnett, J. 2001. Adapting to Climate Change in Pacific Island Countries: The Problem of Uncertainty. *World Development* 29: 977-993.
- Barrow, E., and G.E. Yu. 2005. Climate Scenarios for Alberta. A Report Prepared for the Prairie Adaptation Research Collaborative (PARC) in Co-operation With Alberta Environment. Available at: [www.parc.ca](http://www.parc.ca)
- Bass, B. 2005. Measuring the Adaptation Deficit. Discussion on Keynote Paper: Climate Change and the Adaptation Deficit. *Climate Change: Building the Adaptive Capacity*. A. Fenech, D. Maciver, H. Auld, B. Rong, and Y. Yin, Eds. Environment Canada, Toronto, 34-36.
- Beckley, T., D. Martz, S. Nadeau, E. Wall, and B. Reimer. 2008. Multiple Capacities, Multiple Outcomes: Delving Deeper into The Meaning of Community Capacity. *Journal of Rural and Community Development* 3(3): 56–75.
- Berkes, Fikret, Johan Colding, and Carl Folke. 2003. *Navigating Social-Ecological Systems*. Cambridge: Cambridge University Press.
- Berkes, F. and C. Folke. 1994. Investing in Cultural Capital for a Sustainable Use of Natural Capital. Pp. 128–149 in *Investing in Natural Capital: The*

- Ecological Economics Approach to Sustainability*, edited by A. M. Jansson, M. Hammer, C. Folke, and R. Costanza. Washington, DC: Island Press.
- Berkes, F. and C. Folke. 1998. *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge, UK: Cambridge University Press.
- Bernstein, S. 2001. *The Compromise of Liberal Environmentalism*. New York, NY: Columbia University Press.
- Bernstein, S. 2002. International Institutions and the Framing of Domestic Policies: The Kyoto Protocol and Canada's Response to Climate Change. *Policy Sciences* 35(2): 203–236.
- Biosphere Institute. 2009. Canmore Community Monitoring Program. Available at: <http://www.biosphereinstitute.org/?q=r-com-indicators>
- Biosphere Institute of the Bow Valley. 2008. Community Monitoring Report 2008. Available at: <http://www.canmore.ca/news-and-publications/latest-news/community-monitoring-report-2008.html>
- Biosphere Institute of the Bow Valley. 2009. Bow Valley Sustainability Hub. Available at: <http://www.biosphereinstitute.org/?q=p-sustain-home>
- Blaikie, P., T. Cannon, I. Davis, and B. Wisner. 1994. *At Risk: Natural Hazards, Peoples Vulnerability And Disasters*. London, UK: Routledge.
- Blakeman, L. 2009. Bill 204 Sustaining Municipalities. Website <http://www.laurieblakeman.com/bill204/index.html>

- Bostrom, A., M.G. Morgan, B. Fischhoff, and D. Read. 1994. What Do People Know About Climate Change? Survey Studies of Educated Lay People. *Risk Analysis* 6: 959–970.
- Bourdieu, P. 1986. The Forms of Capital. In Richardson, J.G. (ed.) *Handbook for Theory and Research for the Sociology of Education*, Greenwood Press, New York, pp. 241–258.
- Brooks, N. 2003. Vulnerability, Risk and Adaptation: A Conceptual Framework. Tyndall Centre for Climate Change Research Working Paper 38.
- Brooks, N. and W.N. Adger. 2005. Assessing and Enhancing Adaptive Capacity. Pp. 165–181 in *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*, edited by B. Lim, E. Spanger-Siegfried, I. Burton, E. Malone, and S. Huq. Cambridge: Cambridge University Press.
- Brown, H.C.P. 2009. Climate Change and Ontario Forests: Prospects for Building Institutional Adaptive Capacity. *Mitigation and Adaptation Strategies Global Change* 14: 513–536.
- Burton, I., S. Huq, B. Lim, O. Pilifosova, and E.M. Schipper. 2002. From Impacts Assessment to Adaptation Priorities: The Shaping of Adaptation Policy. *Climate Policy* 2 145–159.
- Canadian Senate Standing Committee on Agriculture and Forestry. 2003. Climate change: We are at risk. Interim Report, Government of Canada, Ottawa, Ont.

- Center for Indigenous Environmental Resources (CIER). 2006. Report 4: First Nations Governance and Climate Change – Key Issues. Prepared for the Assembly of First Nations.
- Davidson, D.J. 2010. Discussion Paper 6 – Climate Change: Projections and Implications for Edmonton. The Edmonton Sustainability Papers. City Of Edmonton.
- Davidson, D.J., M. Haan, and Parlee, B. 2008. The Social Dimensions of Climate Change Vulnerability in Alberta: A Preliminary Assessment, Report Prepared For Alberta Environment (292 pp.).
- Davidson, D.J. and N.A. MacKendrick. 2004. All Dressed Up With Nowhere To Go: The Discourse of Ecological Modernization in Alberta, Canada. *CRSA* 14(1): 47–65.
- Davidson, D.J., A. Wellstead, and R. Stedman. 2004. Political Climate Modeling: Predicting Socio-Political Responses to Climate Change in the Prairie Provinces. Summary Document for the Prairie Adaptation Research Collaborative (PARC). Available at: [www.parc.ca](http://www.parc.ca)
- Davidson, D.J., T. Williamson, and J.R. Parkins. 2003. Understanding Climate Change Risk and Vulnerability in Northern Forest-Based Communities. *Can. J. For. Res.* 33: 2252–2261
- Diaz, H. and A. Rojas. 2006. Methodological Framework for the Assessment of Governance Institutions. IACC Project Working Paper No. 33. Available at: [http://www.parc.ca/mcri/paper\\_browse.php](http://www.parc.ca/mcri/paper_browse.php)

- Diaz H., A. Rojas, L. Richer, and S. Jeannes. 2005. Institutions and Adaptive Capacity to Climate Change. IACC Project Working Paper No. 9.  
Available at: [http://www.parc.ca/mcri/paper\\_browse.php](http://www.parc.ca/mcri/paper_browse.php)
- Douglas, M. 1970. *Natural Symbols: Explorations in Cosmology*. New York, NY: Pantheon Books.
- Douglas, Mary (Ed.). 1982. *Essays in the Sociology of Perception*. London, UK: Routledge.
- Douglas, Mary. 1996. Thought Styles, Critical Essays On Good Taste. London, UK: Sage.
- Dunlap, R.E. 1998. Lay Perceptions of Global Risk: Public Views of Global Warming in Cross-National Context. *International Sociology* 13: 473–498.
- Dunlap, Riley, E. and William Catton, Jr. 1994. Struggling With Human Exemptionalism: The Rise, Decline, and Revitalization of Environmental Sociology. *The American Sociologist* 25(1): 5–30.
- Eakin, H. and A.L. Leurs. 2006. Assessing the Vulnerability of Social-Environmental Systems. *Annu. Rev. Environ. Resour.* 31: 365–94.
- Eckersley, R. 1992. Environmentalism and Political Theory: Toward an Ecocentric Approach (274 pp.). State University Of New York Press; Albany.
- Engle, N. L. and M.C. Lemos. 2010. Unpacking Governance: Building Adaptive Capacity to Climate Change of River Basins in Brazil. *Global Environmental Change* 20(1): 4–13.

- Ermine, W., R. Nilson, D. Sauchyn, E. Sauve, and R. Smith. 2004. Isi Askiwan – The State of the Land: Prince Albert Grand Council Elders' Forum on Climate Change. Summary Document for the Prairie Adaptation Research Collaborative (PARC). Available at: [www.parc.ca/](http://www.parc.ca/)
- Ermine, W., D. Sauchyn, and J. Pittman. 2008. Nikan Oti: Future – Understanding Adaptation and Adaptive Capacity in Two First Nations. PARC Research Report. Available at: [http://www.parc.ca/research\\_pub\\_communities.htm](http://www.parc.ca/research_pub_communities.htm)
- Evans, P. 1996. Government Action, Social Capital and Development: Reviewing the Evidence on Synergy. *World Development* 24: 1119–32.
- Federation of Canadian Municipalities (FCM). 2009. FCM Calls for Cabinet Champion to Fight Crisis in Rural Canada. News Release, May 26, 2009. Available at: <http://www.fcm.ca/english/view.asp?mp=1121&x=1128>
- Fenwick, Fred R. 2005. Consultation in Oil and Gas: Dene Tha' First Nation V. Alberta Energy and Utilities Board. Lawnow Available at: [http://findarticles.com/p/articles/mi\\_m0ojx/is\\_1\\_30/ai\\_n25121528/?tag=content;coll](http://findarticles.com/p/articles/mi_m0ojx/is_1_30/ai_n25121528/?tag=content;coll)
- Folke, C. 2006. Resilience: The Emergence of a Perspective for Social-Ecological Systems Analyses. *Global Environmental Change* 16: 253–267.
- Folke C, Colding J, Berkes F. 2003. Synthesis: Building Resilience and Adaptive Capacity in Social-ecological Systems. In Berkes et al. 2003, pp. 352–87
- Folke, Carl, Steve Carpenter, Thomas Elmqvist, Lance Gunderson, C.S. Holling, and Brian Walker. 2002. Resilience and Sustainable Development:



- Building Adaptive Capacity in a World of Transformations. *Ambio* 31(5): 437–440.
- Folke, C., T. Hahn, P. Olsson, and J. Norberg. 2005. Adaptive Governance of Social-Ecological Systems. *Annual Review of Environmental Resources* 30: 441–473.
- Food and Agriculture Organization of the United Nations (FAO). 2006. The Role of Local Institutions in Reducing Vulnerability to Recurrent Natural Disasters and in Sustainable Livelihoods Development. *The Institutions for Rural Development Series #8*. ISBN 978-92-5-105636-3.
- Ford, J.D., B. Smit, and J. Wandel. 2006. Vulnerability to Climate Change in the Arctic: A Case Study from Arctic Bay, Canada. *Global Environmental Change* 16: 145–160.
- Freudenburg, W. R. 1992. Addictive Economies: Extractive Industries and Vulnerable Localities in a Changing World Economy. *Rural Sociology* 57(3): 305–332.
- Frick, J., F.G. Kaiser, and M. Wilson. 2004. Environmental Knowledge and Conservation Behavior: Exploring Prevalence and Structure in a Representative Sample. *Personality and Individual Differences* 37(8): 1597–1613.
- Fussler, H. M. and R.J.T. Klein. 2006. Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking, *Climate Change* 75(3): 301–329.

- Gagnon-Thompson, S.C. and M.A. Barton. 1994. Ecocentric and Anthropocentric Attitudes Towards the Environment. *Journal of Environmental Psychology* 14: 149–157.
- Gauthier, D.A. and A. Mcfee. No Date. Prairie Rural Communities and Issues of Climate Change. Final Report to the Prairie Adaptation Research Collaborative (PARC). Available at [www.parc.ca](http://www.parc.ca)
- Glantz, M.H. 2001. Currents of Change: Impacts of El Nino and La Nina on Climate and Society. Second Edition. Cambridge, UK: Cambridge University Press.
- Glaser, B. and A. Strauss. 1967. The Discovery of Grounded Theory. Chicago, IL: Aldine.
- Hall, P.A. and R. Taylor. 1996. Political Science and the Three New Institutionalisms. *Political Studies* XLIV, 936–957.
- Harrison, K. and L. McIntosh Sundstrom. 2007. Introduction: The Comparative Politics of Climate Change. *Global Environmental Politics* 7(4): 1–18.
- Hay, C. and D. Wincot. 1998. Structure, Agency, and Historical Institutionalism. *Political Studies* 46(5): 951–957.
- High Level 20/20. 2010. Our Vision. Available at: <http://www.2020highlevel.ca/>
- High Level Woodlands. 2009a. 2007–2008 Annual Performance Report. Available at: [http://www.highlevelwoodlands.com/sfmp/annual\\_report.php](http://www.highlevelwoodlands.com/sfmp/annual_report.php)
- High Level Woodlands. 2009b. PAC Issues and Concerns Tracking Summary. Available at: <http://www.highlevelwoodlands.com/public/pac.php>

- Hodgson, G. M. 2006. What are Institutions? *Journal of Economic Issues* XL(1): 1–25.
- Homer-Dixon, T. 1999. *Environment, Scarcity, and Violence*. Princeton, NJ: Princeton University Press.
- Hubert, M., D.C. Corkal, and H. Diaz. 2009. Government and Civil Society: Adaptive Water Management in the South Saskatchewan River Basin. Chapter 9 in *A Dry Oasis: Institutional Adaptation To Climate On The Canadian Plains*, edited by Marchildon. Canadian Plains Research Center. Regina, Saskatchewan.
- Indian and Northern Affairs Canada (INAC). 2009. Community Well Being Index. Available at: <http://www.ainc-inac.gc.ca/ai/mr/nr/s-d2004/02520abk-eng.asp>
- Indian and Northern Affairs Canada (INAC). 2010. Aboriginal Peoples and Communities. Available at: <http://www.ainc-inac.gc.ca/ap/index-eng.asp>
- Ingram, H., Mann, D. E., Weatherford, G. D., & Cortner, H. J. 1984. Guidelines for Improved Institutional Analysis in Water Resource Planning.” *Water Resources Research* 30 (3): 323-334.
- Intergovernmental Panel on Climate Change (IPCC). 2001. Climate Change, the Scientific Basis (881 pp.). Cambridge: Cambridge University Press.
- Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, edited by M.L. Parry, O.F.

- Canziani, J.P. Palutikof, P.J. Van Der Linden and C.E. Hanson.  
Cambridge, UK and New York, NY, US: Cambridge University Press.
- Jennissen. 1992. Conditions for Environmental Policy Success: An International Comparison *The Environmentalist* 12(1): 47–58.
- Johnston, M., T. Williamson, A. Munson, A. Ogden, M. Moroni, R. Parsons, D. Price, and J. Stadt. 2010. Climate Change and Forest Management in Canada: Impacts, Adaptive Capacity and Adaptation Options (54 pp.). A State of Knowledge Report. Sustainable Forest Management Network, Edmonton, Alberta. Available at:  
[http://www.sfmnetwork.ca/html/soks\\_2010\\_e.html](http://www.sfmnetwork.ca/html/soks_2010_e.html)
- Johnson, T.G. and J.I. Stallman. 1994. Human Capital Investment in Resource-Dominated Economies. *Society and Natural Resources* 7: 221–233.
- Jordan, A. and T. O’Riordan. 1995. Institutional Adaptation to Global Environmental Change (I): Social Institutions, Policy Change and Social Learning. Cserge Working Paper GEC 95-20.
- Jordan, A. and T. O’Riordan. 1997. Social Institutions and Climate Change: Applying Cultural Theory to Practice. Cserge Working Paper GEC 97-15.
- Karol, J. and T. Gale. 2004. Bourdieu’s Social Theory and Sustainability: What is ‘Environmental Capital’? Paper (KAR041081) presented at the AARE International Education Research Conference in Melbourne, Australia Nov 29 - Dec 2, 2004.

- Kelly, P.M. and W.N. Adger. 1999. Social Vulnerability to Climate Change and the Architecture of Entitlements. *Mitigation and Adaptation Strategies for Global Change* 4(3–4): 253–266.
- Kelly, P.M. and W.N. Adger. 2000. Theory and Practice in Assessing Vulnerability to Climate Change and Facilitating Adaptation, *Climatic Change* 47(4): 325–352.
- Kempton, W. 1991. Lay Perspectives on Global Climate Change. *Global Environmental Change* 1(3): 183–208.
- Keskitalo, E., H. Carina, and Antonina A. Kulyasova. 2009. The Role of Governance in Community Adaptation to Climate Change. *Polar Research* 28: 60–70.
- Klein, Richard J. T., Siri E. H. Eriksen, Lars Otto Næss, Anne Hammill, Thomas M. Tanner, Carmenza Robledo, and Karen L. O'Brien. 2007. Portfolio Screening to Support the Mainstreaming of Adaptation to Climate Change into Development Assistance. *Climatic Change* 84: 23–44.
- Koltko-Rivera, M. E. 2000. *Beyond Kluckhohn: A New Model of the World View Construct For Practice And Research in Cross-Cultural Psychology and Education*, Paper Presented at The Teachers College, Columbia University, Midwinter Roundtable on Cross-Cultural Psychology and Education, New York City.
- Koltko-Rivera, Mark E. 2004. The Psychology of Worldviews. *Review of General Psychology* 8(1): 3–58.

- Lamb, B. E. 2007. Institutional Analysis for Environmental Decision-Making: A Symposium. *International Journal of Organization Theory and Behavior* 10(4): 469-575.
- Leiserowitz, A. 2006. Climate Change Risk Perceptions and Policy Preferences: The Role of Affect, Imagery, and Values. *Climatic Change* 77: 45–72.
- Lemmen, D.S. and F.J. Warren. 2004. Climate Change Impacts and Adaptations: A Canadian Perspective. Natural Resources Canada: Ottawa (174 pp.).
- Lemprière, T.C., P.Y. Bernier, A.L. Carroll, M.D. Flannigan, R.P. Gilsenan, D.W. Mckenney, E.H. Hogg, J.H. Pedlar, and D. Blain. 2008. The Importance of Forest Sector Adaptation to Climate Change. Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre, Edmonton, AB. Inf. Rep. NOR-X-416, (104 pp.).
- Machildon, G.P. 2006. Institutional Adaptation to Drought and the Special Areas of Alberta, 1909–1939. IACC Project Paper. Available at: [http://www.parc.ca/mcri/paper\\_browse.php](http://www.parc.ca/mcri/paper_browse.php)
- Marchildon, G., S. Kulshreshtha, E. Wheaton, and D. Sauchyn. 2007. Drought and Institutional Adaptation in Alberta and Saskatchewan, 1914–1939. IACC Project Paper. Available at: [http://www.parc.ca/mcri/paper\\_browse.php](http://www.parc.ca/mcri/paper_browse.php)
- Machlis, G.E., J.E. Force, and W.R. Burch. 1990. Timber, Minerals and Social Change: An Exploratory Test of Two Resource Dependent Communities. *Rural Sociology* 55(3): 411–424.

- MacKendrick, N.A. and J.R. Parkins. 2004. Frameworks for Assessing Community Sustainability: A Synthesis of Current Research in British Columbia. Information Report NOR-X-392, Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre, Edmonton, AB.
- Mackenzie Regional Waste Management Commission. August 20, 2004. Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=163>
- Mackenzie Regional Waste Management Commission. January 8, 2008. Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=163>
- Magdanz, J.S., C.J. Utermohle, and R.J. Wolfe. 2002. *The Production and Distribution of Wild Food in Wales and Deering, Alaska*. Technical Paper 259. Division of Subsistence, Alaska Department Of Fish And Game, Juneau, Alaska.
- Malka, A., J.A. Krosnick, and G. Langer. 2009. The Association of Knowledge with Concern about Global Warming: Trusted Information Sources Shape Public Thinking. *Risk Analysis*, 29: 633–647.
- McNicol, B. and G. Buxton. 2006. Second Home Ownership Study. Town of Canmore. Available at: <http://www.canmore.ca/municipal-sustainability/economic/second-home-owner-study.html>
- Mcleman, R. and B. Smit. 2006. Migration as an Adaptation to Climate Change. *Climatic Change*, 76: 31–53.

- Mendis, S., S. Mills, and J. Yantz. 2003. Building Community Capacity to Adapt to Climate Change in Resource-Based Communities. Canadian Forest Service, Saskatchewan.
- Merriam, S.B. 1998. Qualitative Research and Case Study Applications in Education. San Francisco, CA: Jossey-Bass Publishers.
- Mining the Future. 2005. Mining The Future: A Vision for Canmore. Available at: <http://www.canmore.ca/municipal-sustainability/civic-leadership/mining-the-future-a-vision-for-canmore.html>
- Moellendorf, D. 2009. Treaty Norms and Climate Change Mitigation. Carnegie Council for Ethics in International Affairs.
- Morito, Bruce. 2006. Values Analysis and Institutional Adaption to Climate Change. IACC Project Working Paper No. 30.
- Naess, L.O., G. Bang, S. Eriksen, and J. Vevatne. 2005. Institutional Adaptation to Climate Change: Flood Responses at The Municipal Level in Norway. *Global Environmental Change* 15: 125–138.
- Narayan, D. 1999. *Bonds and Bridges. Social Capital and Poverty*. Washington DC: The World Bank Policy Research Working Paper No. 2167.
- Nelson, Donald R., W. Neil Adger, and Katrina Brown. 2007. Adaptation to Environmental Change: Contributions of a Resilience Framework. *Annu. Rev. Environ. Resour.* 32: 395–419.
- Nisbet, M.C. and T. Myers. 2007. The Polls—Trends: Twenty Years of Public Opinion About Global Warming. *Public Opinion Quarterly* 71: 444–470.



North, D.C. 1990. Institutions, Institutional Change, and Economic Performance.  
Cambridge, UK: Cambridge University Press.

Northern Alberta Development Council (NADC). 2006. Shadow Populations in  
Northern Alberta. Preliminary Report Prepared For the NARD by Mary  
Joan Aylward.

Northern Alberta Development Council (NADC). 2009a. Analysis of the  
Economic Contribution of the Northern Alberta Development Council  
Region to Alberta and Canada. Available at:  
[Http://Www.Nadc.Gov.Ab.Ca/Publications/Reports/2009-Northern-Contributions.Pdf](http://www.nadc.gov.ab.ca/Publications/Reports/2009-Northern-Contributions.Pdf)

Northern Alberta Development Council (NADC). 2009b. Developing Northern  
Alberta: Northern Challenges, Assets and Opportunities: A Discussion  
Paper. Available at:  
<http://www.nadc.gov.ab.ca/publications/reports/developing-northern-ab.pdf>

Nyong, A., F. Adesina, and B.O Elasha. 2007. The Value of Indigenous  
Knowledge in Climate Change Mitigation and Adaptation Strategies in the  
African Sahel. *Mitigation and Adaptation Strategies to Global Change* 12:  
787–797.

O'Brien, K., S. Eriksen, A. Schjolden, and L. Nygaard. 2004. What's in a Word?  
Conflicting Interpretations of Vulnerability in Climate Change Research.  
Center For International Climate and Environmental Research, Available  
at: <http://www.cicero.uio.no/media/2682.pdf>

- O'Connor, R.E., R.J. Bord, and A. Fisher. 1999. Risk Perceptions, General Environmental Beliefs, and Willingness to Address Climate Change. *Risk Analysis* 19(3): 461–471.
- Ogden, A.E. and J.L. Innes. 2008. Climate Change Adaptation and Regional Forest Planning in Southern Yukon, Canada. *Mitigation and Adaptation Strategies to Global Change* 13: 833–861.
- O'Riordan, T. and A. Jordan. 1995. The Precautionary Principle in Contemporary Environmental Politics. *Environmental Values* 4: 199-212.
- O'Riordan, T. and A. Jordan. 1999. Institutions, Climate Change and Cultural Theory: Towards a Common Analytical Framework. *Global Environmental Change* 9: 81–93.
- Ostrom, E., J. Burger, C.B. Field, R.B. Norgaard, and D. Polincansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284(5412): 278–282.
- Pahl-Wostl, C. 2009. A Conceptual Framework for Analysing Adaptive Capacity and Multi-Level Learning Processes in Resource Governance Regimes. *Global Environmental Change* 19: 354–365.
- Pahl-Wostl, C., J. Sendzimir, P. Jeffrey, J. Aerts, G. Berkamp, and K. Cross. 2007. Managing Change Toward Adaptive Water Management Through Social Learning. *Ecology and Society* 12(2): 30. Available at: <http://www.ecologyandsociety.org/vol12/iss2/>

- Parkins, J.R. 2008. The Metagovernance of Climate Change: Institutional Adaptation to the Mountain Pine Beetle Epidemic in British Columbia. *Journal of Rural and Community Development* 3(2): 7–26.
- Parkins, J.R. and N.A MacKendrick. 2007. Assessing Community Vulnerability: A Study of the Mountain Pine Beetle Outbreak in British Columbia, Canada. *Global Environmental Change* 17: 460–471.
- Pelling, M. and C. High. 2005. Understanding Adaptation: What Can Social Capital Offer Assessments of Adaptive Capacity? *Global Environmental Change* 15(4): 308–319.
- Pelling, M. and J. Uitto. 2001. Small Island Developing States: Natural Disaster Vulnerability and Global Change. *Environmental Hazards* 3: 49–62.
- Pembina Institute. 2008. Environmental Groups Pull Out of Multi-Stakeholder Oil Sands Process. News Release August 18, 2008. Available at: <http://www.pembina.org/media-release/1678>
- Pendergraft, Curtis A. 1998. Human Dimensions of Climate Change: Cultural Theory and Collective Action. *Climatic Change* 39: 643–666.
- Ploeg, C.G.V. 2008. Problematic Property Tax: Why The Property Tax Fails To Measure Up and What to Do About It. Canada West Foundation Publication. Available at: <http://www.cwf.ca/v2/files/problematic.pdf>
- Regional Economic Development Initiative (REDI). 2008. Grow North Comprehensive Business Plan 2008. Available at: <http://www.rediregion.ca/redi/nwaavc.php>

- Regional Economic Development Initiative (REDIb). 2009. REDI Regional Tourism Plan 2009. Available at:  
<http://www.rediregion.ca/studies/index.php>
- Regional Economic Development Initiative (REDIa). 2009. Incredible Communities. Available at:  
<http://www.rediregion.ca/discover/communities.php#highlevel>
- Ribot, J.C. 1995. From Exclusion to Participation: Turning Senegal's Forestry Policy Around? *World Development* 23:1587–1599.
- Richards, L. and J.M. Morse. 2007. *Readme First for a User's Guide to Qualitative Methods*. Second Edition. Thousand Oaks, CA: Sage Publications, Inc.
- Robledo, C., M. Fischler, and A. Patino. 2004. Increasing the Resilience of Hillside Communities in Bolivia. *Mt. Res. Dev.* 24: 14–18.
- Rokeach, M. 1973. *The Nature of Human Values*. New York, NY: Free Press.
- Sauchyn D. and S. Kulshreshtha. 2007. The Prairies. Pp. 275–328 in *From Impacts To Adaptation: Canada In A Changing Climate 2007*, edited by D. Lemmen, F. Warren, E. Bush, and J. Lacroix. Ottawa: Government of Canada (Natural Resources Canada).
- Schindler, D.W. and W.F. Donahue. 2006. An Impending Water Crisis in Canada's Western Prairie Provinces. *Proc. Natl. Acad. Sci. USA* 103: 7210–7216.
- Scott, D. and G. McBoyle. 2007. Climate Change Adaptation in the Ski Industry. *Mitigation and Adaptation Strategies for Global Change* 12: 1411–1431.

- Scott, W.R. 2008. *Institutions And Organizations; Ideas And Interests*. Sage Publications, Inc.
- Sen, A.K. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford, UK: Clarendon.
- Slovic, P. 2000. *The Perception of Risk*. London, UK: Earthscan.
- Smit, B. and O. Pilifosova. 2001. Adaptation to Climate Change in the Context of Sustainable Development and Equity. Chapter 18 in *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, UK: Cambridge University Press.
- Smit, B. and J. Wandel. 2006. Adaptation, Adaptive Capacity, and Vulnerability, *Global Environmental Change* 16(3):282–292.
- Statistics Canada. 2006. Community Profiles. Available at:  
<http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?lang=e>
- Statistics Canada. 2008. Aboriginal Peoples Survey. Available at:  
<http://www.statcan.gc.ca/>
- Stedman, R.C. 2004. Risk and Climate Change: Perceptions of Key Policy Actors in Canada. *Risk Analysis* 24(5): 1395- 1406.
- Stedman, R.C., J.R. Parkins, and T.M. Beckley. 2004. Resource Dependence and Community Well-Being in Rural Canada. *Rural Sociology* 69(2): 213–234.

- Stoker, G. 1998. Governance as Theory: Five Propositions. *International Journal of Social Sciences* 155: 17–28.
- Strauss, A. and J. Corbin. 1990. *Basics of Grounded Theory Methods*. Beverly Hills, CA: Sage.
- Sutherland, K., B. Smit, V. Wulf, and T. Nakalevu. 2005. Vulnerability to Climate Change and Adaptive Capacity in Samoa: The Case of Saoluafata Village. *Tiempo* 54: 11–15.
- Sygna, L. 2005. *Climate Vulnerability in Cuba: The Role of Social Networks*. CICERO Working Paper, 2005-01, University of Oslo, Oslo, Norway (12 pp.).
- Ten Thousand Five (10005) House. 2007. Status Report. Available at: [http://10005house.ca/reports\\_and\\_stats/index.php](http://10005house.ca/reports_and_stats/index.php)
- The Echo. September 17, 2008. High Level Residents Offer Input at Community Meeting. 36(37):1–2.
- The Sheltair Group. 2005. Town of Canmore Energy Management Action Plan. Available at: <http://www.canmore.ca/municipal-sustainability/environmental/environmental-care-program.html>
- Thomalia, F., T. Downing, E. Spanger-Siegfried, G. Han, and J. Rockström. 2006. Reducing Hazard Vulnerability: Towards a Common Approach Between Disaster Risk Reduction and Climate Adaptation. *Disasters* 30(1): 39–48.
- Tol, R.S.J, M. Bohn, T.E. Downing, M. Guillerminet, E. Hizsnyik, R. Kaspersen, K. Lonsdale, C. Mays, R.J. Nicholls, A.A. Olsthoorn, G. Pfeifle, M. Poumadere, F.L. Toth, N. Vafeidis, P.E. Van Derwerff, and I.H. Yetkiner.

2006. Adaptation to Five Metres of Sea Level Rise. *J. Risk Res.* 9: 467–482.
- Tol, R.S.J., R.J.T. Klein, and R.J. Nicholls. 2008. Towards Successful Adaptation to Sea-Level Rise Along Europe's Coasts. *Journal of Coastal Research* 24(2), 432–442. West Palm Beach, FL: ISSN 0749-0208.
- Tol, R.S.J., N. Van Der Grijp, A.A. Olsthoorn, and P.E. Van Der Werff. 2003. Adapting to Climate: A Case Study on Riverine Flood Risks in The Netherlands. *Risk Analysis* 23: 575–583.
- Tolko Industries Ltd. 2009. News Release: Tolko High Level Employees Ratify Agreement. Available at:  
[http://www.tolko.com/news/releases/dec19\\_2009.php](http://www.tolko.com/news/releases/dec19_2009.php)
- Tompkins, E., 2005: Planning for Climate Change in Small Islands: Insights From National Hurricane Preparedness in the Cayman Islands. *Global Environmental Change* 15: 139–149.
- Tompkins, E., W.N. Adger, and K. Brown. 2002. Institutional Networks for Inclusive Coastal Management in Trinidad and Tobago. *Environment and Planning A* 34: 1095–1111.
- Tompkins, E.L. and W.N. Adger. 2004. Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change? *Ecology and Society* 9(2): 10. Available at: <http://www.ecologyandsociety.org/vol9/iss2/art10>
- Town of Canmore. 2003. Affordable and Entry Level Housing Study. Available at: <http://www.canmorehousing.ca/aboutus.htm>

Town of Canmore. 2004. Canmore Takes the Natural Step Toward Sustainability.

Available at: <http://www.canmore.ca/municipal-sustainability/the-natural-step/the-natural-step.html>

Town of Canmore. 2008. 2008 Canmore Census. Available at:

<http://www.canmore.ca/news-and-publications.html>

Town of Canmore. 2008b. Comprehensive Housing Action Plan: Terms of

Reference. Available at: <http://www.canmore.ca/municipal-sustainability/social/comprehensive-housing-action-plan.html>

Town of Canmore. 2008c. Canmore Sense of Community Survey. Available at:

[http://www.canmore.ca/index.php?option=com\\_docman&task=cat\\_view&itemid=354&gid=315&orderby=dmdatecounter&ascdesc=desc](http://www.canmore.ca/index.php?option=com_docman&task=cat_view&itemid=354&gid=315&orderby=dmdatecounter&ascdesc=desc)

Town of Canmore. 2009a. Comprehensive Housing Action Plan. Available at:

<http://www.canmore.ca/municipal-sustainability/social/comprehensive-housing-action-plan.html>

Town of Canmore. 2009b. About Canmore. Available at:

<http://www.canmore.ca/about-canmore/>

Town of Canmore. 2010a. Signposts to Sustainability. Available at:

<http://www.canmore.ca/municipal-sustainability/civic-leadership/signposts-to-sustainability.html>

Town of Canmore. 2010b. Environmental Care Program. Available at:

<http://www.canmore.ca/municipal-sustainability/environmental/environmental-care-program.html>



Town of High Level. November 19, 2001. Council Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=198>

Town of High Level. October 27, 2003. Council Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=198>

Town of High Level. 2004. Municipal Development Plan.

Town of High Level. December 11, 2006. Council Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=198>

Town of High Level. November 26, 2007. Council Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx>

Town of High Level. November 24, 2008. Council Meeting Minutes. Available at: <http://highlevel.fileprosite.com/documents/documentlist.aspx?id=198>

Town of High Level. 2008. Citizen Satisfaction Survey Results.

Town of High Level. 2009a. Economic Base. Available at: <http://www.highlevel.ca/siteengine/activepage.asp?pageid=4>

Town of High Level. 2009b. The Mayor's Minute. Available at: <http://www.highlevel.ca/siteengine/activepage.asp?pageid=9>

Town of High Level. 2010. The Mayor's Minute. Available at: <http://www.highlevel.ca/siteengine/activepage.asp?pageid=9>

United Nations University, Institute for Environment and Human Security (UNU-IEHS). 2005. As Ranks of "Environmental Refugees" Swell Worldwide, Calls Grow for Better Definition, Recognition, Support. Press Release October 11, 2005. Available at: <http://www.ehs.unu.edu/article:130>

- Wall, Ellen and Katia Marzall. 2006. Adaptive Capacity for Climate Change in Canadian Rural Communities. *Local Environment* 11(4): 373–397.
- Warner, M. 2001. Building Social Capital: The Role of Local Government. *Journal of Socio-Economics* 30: 187–192.
- Wellstead, A.M. and R.C. Stedman. 2007. Coordinating Future Adaptation Policies Across Canadian Natural Resources. *Climate Policy* 7: 29–45.
- Wemers, S.E., Z. Flachner, P. Matczak, M. Falaleeva, and R. Leemans. 2009. Exploring Earth System Governance: A Case Study of Floodplain Management Along The Tisza River in Hungary. *Global Environmental Change* 19(4): 503–511.
- Wilbanks, T.J. 2002. T.J. Wilbanks, Geographic Scaling Issues in Integrated Assessments of Climate Change. *Integr. Assess.* 3: 100–114.
- Wilbanks, T.J. and R.W. Kates. 1999. Global Change in Local Places: How Scale Matters. *Climatic Change* 43: 601–628.
- Williamson, T.B., D.T. Price, J.L. Beverly, P.M. Bothwell, J.R. Parkins, M.N. Patriquin, C.V. Pearce, R.C. Stedman, and W.J.A. Volney. 2007. A Framework for Assessing Vulnerability of Forest-Based Communities to Climate Change. Canadian Forest Service. Government of Canada. Information Report NOR-X-414.
- Wittrock, V. and E. Wheaton. 2007. Towards Understanding The Adaptation Process for Drought in the Canadian Prairie Provinces: The Case of the 2001 to 2002 Drought and Agriculture. Saskatchewan Research Council, Saskatoon, Saskatchewan. SRC Publication No. 11927-2E07 (130 pp.).

- Woolcock, M. 2001. The Place of Social Capital in Understanding Social and Economic Outcomes. *Canadian Journal of Policy Research* 2(1): 11–17.
- Woolcock, Michael, and Deepa Narayan. 2000. Social Capital: Implications for Development Theory, Research, and Policy. *World Bank Research Observer* 15 (2): 225–50.
- World Meteorological Organization. 2007. The State of Greenhouse Gases in the Atmosphere Using Global Observations Through 2007. Greenhouse Gas Bulletin Number 4.
- Yin, R.K. 2003. *Applications of Case Study Research*. Beverly Hills, CA: Sage Publishing.
- Young, Donovan. 2010. Aboriginal Economic Participation. Presentation Made at the 2010 Policy Matters Conference June 14–15, 2010 in Edmonton, Alberta.

## **7 Appendix A Interview Guide**

### 1.0 About You and Your Community

How long have you lived in (name community)?

How would you describe (your community)?

Possible prompts and follow-up: What makes (community name) a nice place to live? What is unique about (community name)? Is there a strong sense of cohesion here?

How long have you worked for this organization?

How long have you been working in your current position?

## 2.0 Questions about Climate Change

What are some of the biggest issues of concern for [name community] these days?

Prompt if not mentioned: Is there any attention being paid to climate change issues in the community?

Can you tell me what you know about climate change, and how you think it may affect, or is affecting, [name community] or not.

Has climate change been a topic of interest for [name organization]?

Is there agreement or disagreement within your organization regarding this topic?

Has your organization taken action as a result of climate change concern in any way?

[If yes] Why do think this is important?

[If not raised in previous question] Has your organization made any efforts to get more information about climate change?

## 3.0 Assessment of Organizational Efficacy

In your own words, what is the mission of [organization name]?

How do you know when your organization is doing a good job or not? [If not clear]: Do you have performance indicators that are evaluated regularly?

[If so] What happens when performance indicators suggest poor performance?

Can you tell me about a particular instance in which in your opinion your organization did not perform well?

Was there an organizational response to this event? [Or]

Do you feel that your organization learned from this?

Do members of your organization regularly seek information from outside of your own organization in order to do your job effectively, or to improve performance?

[If so] What are the sources of that information?

Do you feel you have sufficient staff and financial resources to pursue your organization's mission effectively?

Are there any other constraints on your organization's ability to pursue its mission?

Does (name organization) need approval from anyone else before it makes decisions?

Does the organization have the ability to provide input into community-level decision-making?

Does your organization have input into provincial-level decision-making that affects (community name)?

Can you tell me about an instance in which your organization was faced with a sudden, unexpected event that posed a challenge to your organization?

#### 4.0 Organizational Relations

What other organizations do you work with regularly in order to pursue your organizational mission?

What are relationships like between this organization and those that you work with?

What are the biggest constraints to organizational cooperation?

Who do you believe should bear the most responsibility for climate change adaptation: the municipal government, the provincial government, the federal government, private corporations, or someone else?

Do you think that these organizations have the ability to ensure effective climate change adaptation?