Chapter 33
Opportunities and Barriers for Adaptation and Local Adaptation Planning in Canadian Rural and Resource-Based Communities

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Abstract This chapter describes various forces that influence the ability of decision-making and institutional structures in Canadian rural and resource-dependent communities to manage, plan for, and respond to future risks and uncertainties resulting from climate change. The context within which such communities make decisions related to capacity building is the outcome of historical development trajectories, interactions with higher levels of government, and macro-level economic structures and processes. The success of future capacity building and planning will be strongly influenced by such factors as improved coordination across different levels of government, the provision of locally geared information about environmental and climate change, economic diversification and the ability to adjust to and take advantage of rapidly changing demographic patterns in such communities.

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Introduction

Residents and decision makers in rural and resource-dependent communities across Canada are increasingly aware that climatic variability and change may bring attendant risks to community livelihoods and well-being (Brklacich et al. 1997; Bryant et al. 2000; Reid et al. 2007). The work that has been done to date on climate change adaptation in Canada has often tended to focus on broad scale (i.e., national or regional) adaptation needs and on adaptation to the impacts of climate change on particular attributes of economic systems or sectors (e.g., Brklacich et al. 2007; Scott and McBoyle 2007; Spittlehouse and Stewart 2003). Research into community-level adaptation needs and implementation of responsive policies and planning is more recent and, of particular importance to this chapter, is not necessarily well known to local-level decision makers.

In this chapter, we describe and explore various forces that influence the ability of decision-making and institutional structures in Canadian rural and resource-dependent communities to manage, plan for and respond to future risks and uncertainties resulting from climate change. The examples are drawn from two participant communities in a multiyear comparative study of barriers to and opportunities for adaptation in selected Canadian communities where local livelihoods are tied strongly to land- or resource-based economic activities. The two participant communities described here – Alert Bay, British Columbia and Change Islands, Newfoundland (Fig. 33.1) – are both located on islands, but have very different historical trajectories, economies, demographic characteristics, and institutional arrangements. While some details are necessarily specific to the particular context of each community, the emphasis here is on describing broader insights that may be applicable to a range of rural and resource-based communities across Canada and in other developed nations.

Brief Description of Each Community, Climate-Related Stresses, and Institutional Context

Alert Bay, British Columbia

Alert Bay is a multicultural community of 1,300 people of First Nation and non-First Nation ancestry located on Cormorant Island, off the northeastern shore of much larger Vancouver Island. The relatively isolated island is home to the

Fig. 33.1 The two participant communities: Alert Bay, British Columbia and Change Islands, Newfoundland

people of the Village of Alert Bay, the 'Namgis First Nation, and a roughly 5-ha parcel of land set aside for use by people from outlying First Nations villages (called Whe-La-La-U). The development paths of the island's First Nation people, whose livelihoods have been strongly tied to traditional resource-based livelihood activities, and nonnative settlers, whose economy was also built on commercial resource extraction, are closely intertwined. Alert Bay has a relatively stable and large proportion of young people. Relations between the island's native and non-native population are generally good, and there is ongoing cooperation between groups on a formal and informal basis. The historic Alert Bay Accord, a formally recognized infrastructure and economic development agreement, exemplifies the level of cooperation that assists the whole Island community in its progressive development.

Decades of overexploitation have led to a decline in the quality and quantity of two key resources: salmon and forests. The local economy has become increasingly diversified in recent years. Sales and services now represent the largest employment sector, and the 'Namgis First Nation government is the largest employer. An aggregate mine developed in 2006 as a joint venture between the 'Namgis First Nation and a private company could generate over $1 million annual revenue for the 'Namgis First Nation in coming years. New types of timber initiatives and small-scale run-of-the-river hydroelectric projects are also being undertaken. Tourists are being attracted to the area to watch the resident orca population, learn of the rich diversity of the area and, probably most importantly, experience the richness of

First Nation culture. Residents are concerned about the potential impacts of climate change on the region's forests and marine resources and have ongoing concerns about extreme weather events, storm surges, and the longer term implications of sea level change.

Cormorant Island has a complex institutional environment. The Village of Alert Bay, the 'Namgis First Nation Council, and the Whe-La-La-U Area Council all have distinct political and administrative responsibilities and areas, and the 'Namgis are in turn part of a larger tribal council representing four affiliated Kwakwaka'wakw Nations. All of their respective offices are located in Alert Bay. At least nine community and regional plans and four provincial and federal government-led plans related to land and resources are currently underway. The 'Namgis First Nation has a team of planning staff engaged in the treaty process, a sizable planning budget, and resources devoted to environmental monitoring. Ongoing efforts have been made to coordinate the planning activities and administrative tasks of the Village of Alert Bay and 'Namgis Councils.

Change Islands

Livelihoods in Change Islands off Newfoundland's Atlantic coast have historically been tied to commercial cod fishing. A century ago, its 1,000 residents formed a prosperous but isolated community. The population has since declined to approximately 300, as a result of ongoing structural changes in the fishing industry and a 1992 government-imposed moratorium on cod fishing following the collapse of North Atlantic cod stocks due to overfishing. Out-migration of employment-seeking young adults has left the community with an aging population.

In recent decades, winters have become milder and summers have become warmer, trends that residents believe may be affecting the composition of species found in inshore waters. Warmer water temperatures are bringing new species of fish and mammals to the area, while other species no longer come inshore in the numbers they once did. Fishing seasons prescribed by the federal Department of Fisheries and Oceans increasingly fall later than the times when the numbers of commonly fished species, such as lobster and crab, are at their highest in local waters. In addition to fishing, residents engage in land-based subsistence activities such as harvesting from woodlots, collecting wild berries, and maintaining vegetable gardens. Residents and local businesses are attempting to cater to and attract more tourists to decrease their dependency on fishing. Attempts to create small-scale manufacturing jobs locally have not proved successful so far. Despite ongoing efforts in economic diversification, the fish processing plant remains the largest single employer in the community.

Local municipal government is responsible primarily for maintaining roadways and water services within the municipal boundaries. Other critical services on which residents are dependent, such as ferry services, highways, health care, education, and fishing licenses, are controlled and managed by provincial or federal govern-

ment ministries based elsewhere. Beyond economic development initiatives, little governance or planning occurs at the regional level. Community social networks and the social capital (Castle 2002) that has been built within them over many years are critical assets to ensuring the community's future ability to cope with and adapt to environmental and non-environmental stresses. This social capital is rapidly eroding in the face of population decline, which leaves fewer people available to participate in community activities.

Common Themes in the Formation of Community Vulnerability

In both communities, global environmental changes and societal changes interact to create exposure at the local level to particular environmental risks and to influence the capacity of the community to adapt to those risks. In Table 33.1, we summarize some critical themes that emerged during the project, with illustrations from the two island communities.

As might be expected from the contents of Table 33.1, it quickly emerged during this study that residents of these communities do not necessarily separate climate-related risks from the broader range of environmental stressors to which they currently adapt. Instead, variability in environmental conditions, including climatic variability, is typically seen as being a fact of life. There is no assumption that environmental conditions are ever entirely predictable or stable. Instead, residents tend to view vulnerability as emerging from the combined interaction of environmental and socioeconomic changes, with changes in climatic conditions and events being one element in such interactions.

The nature of these interactions is shaped by past histories and dynamic societal changes, which are experienced through consequent changes in governance structures, resource accessibility, local economic conditions, and demographic patterns, among others. Future trajectories, vulnerabilities, and adaptive capacity will be shaped and limited by past trajectories and become further modified by present institutional arrangements, such as resource management regulations prescribed by higher levels of government that are beyond the scope of the communities' direct influence.

Local adaptive capacity is strongly influenced by social networks and the social capital embedded within them. This social capital is sensitive to changes in the demographic conditions of the community, especially in terms of its age structure and cultural makeup, and is easily eroded by relying too often on the same individuals or groups to lead community initiatives. Related to this is a current recognition of the linkages between environmental stewardship and capacity building; this ethos differs significantly from past, exploitative approaches taken to resources, and sees the combined social and environmental well-being of the community for the long term as being preferable to short-term economic gains. That said, the ability to practice stewardship and the ways in which it can be done vary significantly between communities as a result of their different socioeconomic contexts. In Alert Bay,

Table 33.1 Key themes in vulnerability identified in Alert Bay and Change Islands

	Examples	
Theme	Alert Bay	Change Islands
Climate change is situated within broader environmental changes	Overexploitation has led to a decline in the quantity of salmon resources and the quantity and quality of forest resources	Intensive harvest has severely depleted fisheries resources
Historical trajectories shape future adaptation options	Current societal conditions occur in spite of the 'Namgis First Nation's long struggle to assert control over land and marine resources in face of exploitation by nonlocal interests	Fisheries collapse drives out-migration, in turn depleting social capital
Interactions across governance scales influence vulnerability	Size of salmon stocks and amount to be harvested influenced by Canadian, American fishing policies, and poor harvest strategies imposed by government	Fish plant operator is seeking outside "eco-friendly" certification to increase value of product
Demographic trends shape adaptive capacity	Formal and informal networks among Aboriginal and non-Aboriginal communities often work to mutual advantage	"Bridging" social capital needed to better integrate long-term residents and recently arrived groups
Stewardship ethos reduces vulnerability	"Fishery guardian" positions created to monitor local fisheries in absence of federal patrols	Individuals protect a rare breed of island horse and thereby create tourist attraction
Over-reliance on particular economic sectors increases vulnerability	Depletion of salmon and forest resources has driven communities to develop new partnerships, new activities, but these economic adjustment crisis have taken 20 years to develop	Tourism industry being pursued as means to reduce dependence on fish processing plant for jobs
Adaptive capacity is tied to social capital	Village of Alert Bay Advisory Planning Commission is volunteer-run	Volunteer committee found new operator for fish processing plant when former owner closed up

stewardship is carried out through formal structures such as the 'Namgis fishery guardian program which monitors local fisheries for conservation purposes. With its small population base, Change Islands sees stewardship practiced more on an

individual level, such as a family that established a refuge to preserve the rare Newfoundland Pony, thereby creating a tourist attraction.

In both communities, reliance on a small number of economic activities is seen as a key driver of vulnerability to socioeconomic and environmental changes that must be overcome. The changing economy of Cormorant Island (Alert Bay) is still in recovery from the overexploitation of salmon stocks and local forests, a situation that is slowly being overcome through new developments in aggregate mining and small-scale hydroelectric generation and tourism. The community of Change Islands has yet to recover fully from the closure of the cod fishery and consequent large-scale out-migration of younger residents that shrank the local labor force and eroded social capital. While tourism to the area has been growing, it does not approach the scale of local economic benefits provided by the fish plant.

Advancing Adaptive Capacity in Rural and Resource-Dependent Communities

Despite the differences in the planning structures and environment between the study communities, residents identified four categories of shared challenges to increasing their capacity to plan for and adapt to future risks, climate change related or otherwise. Each of these is described in turn.

Inadequate Resources for Planning and Coordination with Higher Levels of Government

The first set of challenges is the creation and maintenance of a well-functioning mixture of formal and informal institutions at the local level, which is absolutely critical to ongoing community well-being and good governance. In turn, these local institutions must be able to interact efficiently with any number of other agencies in more senior levels of government to conduct short- and long-term planning. The efficiency of coordination among these various interacting levels of government can either support or impede a community's adaptive capacity. While higher levels of government tend to have the resources, expertise, and dedicated staff to administer and manage policies and programs and to continuously engage in forward planning, people engaged at the local community level must wear many hats. Often, those engaged in local planning are volunteers who must "learn the file" as they go along. This undermines the local community's potential to engage in long-term planning and to manage relations with higher levels of government. The need to engage volunteers in formal planning processes puts an extra draw on the community's social capital, thereby reducing its availability for other initiatives. Higher levels

of government must recognize this fact and make additional professional resources available to local communities if they are to be partners in adaptation planning.

One-Size Regulations Do Not Fit All and Can Impede Capacity Building

The rules and regulations pertaining to any given activity or sector are formulated by higher levels of government to address a much wider range of situations than typically apply in any one local area. Complying with such directives can often have unintended negative impacts on local communities where specific problems that necessitate such regulations simply do not exist. For example, in Newfoundland regulations pertaining to tourism and hospitality – an economic sector critical to economic diversification and in Change Islands – are designed with year-round (typically urban) service establishments in mind. These regulations require seasonal operators (which describes most Change Islands' tourist businesses) to make modifications to premises, purchase expensive operating permits, and take other steps that can quickly make a seasonal operation unviable. Many other examples of this type suggest that one-size-fits-all regulations can retard community development and reduce the capacity of small communities to expand their economic base and secure their future livelihoods. While it may be argued that any system of institutional arrangements will have its share of inherent inefficiencies, at higher levels of government the costs of such inefficiencies are distributed across a wide geographic and population base. When it must be borne by rural communities with small populations and limited capital, the costs of institutional inefficiency are disproportionately higher.

Climate Change Information is Not Well Suited to Local Communities' Needs

A second common challenge to future adaptation planning is the unavailability of the types of information rural communities need about the potential impacts of climate change. Scientific information such as that generated from general circulation models (GCMs) is generally and most reliably expressed in terms of changes in average temperature conditions over large areas and, with a lesser degree of reliability, changes in precipitation regimes, again over large areas. The spatial scale of climate change information is typically too coarse to capture the local details rural community planners need, and the types of impact scenarios being generated and used by the climate science community are often not meaningful at the community level. Extreme events, such as the frequency and timing of hail or the potential for above-average accumulations of snow, are more pressing concerns for

rural communities than changes in long-term average conditions, but climate science tends not to produce these specific analyses regularly or reliably. Furthermore, residents of rural communities lack the resources and expertise to translate climate change information, especially when expressed using scientific jargon, for use in a practical or quotidian sense at the local level.

How to Balance Economic Diversification While Maintaining Community Identity

These communities are socially, economically, and culturally rooted within their surrounding environments and resource bases. Residents often have a sophisticated knowledge of trends and patterns of change in those conditions and how to respond to such changes. At the same time, residents recognize future capacity building requires reducing their overdependence on small sets of resources and activities. In their view, diversification of the local economic base should not entail an abandonment of a community's traditional economic base, its accompanying sociocultural identity, and the social capital that has been generated by pursuing such livelihoods; rather, existing assets and activities should be leveraged to achieve diversification. For example, Alert Bay has used its First Nations heritage to develop its tourism industry, while Change Islands promotes its lack of development and isolated location as attractions for urban visitors. That said, tourism alone cannot provide a sufficient economic base to guarantee the long-term viability of either study community. Tourist numbers fluctuate considerably according to macroeconomic trends, and expanding and maintaining tourism infrastructure often requires access to financial capital beyond that available in rural communities. This in turn reveals additional needs that must be met to facilitate economic diversification, such as building multiple partnerships that would develop joint private–public sector ventures, promoting greater cooperation among neighboring communities in a given region, and facilitating engagement between formal and informal economic sectors. Such partnerships are seen as having the potential to expand the access of rural communities to capital, expertise, and information to build synergies and facilitate innovation.

Going Forward

Rural planning officials in both study communities, whether professional employees or volunteers, suggest they are at a crossroads. Both emphasize that more comprehensive formal planning will enhance their capacities to respond positively to future challenges and opportunities, climate-related or otherwise, if they have the necessary means to do so. They share a number of strong ideas on how to

make adaptive planning both comprehensive and more inclusive. Local planners envisage supporting and coordinating a wide range of planning initiatives, including economic, social, and environmental planning. They would like to include all legitimate voices in the community, and particularly expand representation of youth, newcomers, and other groups who are often excluded from the planning process as it is currently conducted. Local planners would also like to improve coordination across sectors and governments. They would like to move away from less flexible plans that require firm predictions of the likelihood of future events, and shift toward contingency management of risks combined with deliberate building of capacity to adapt to risks known and unknown, one of which would be climate change and its impacts. But to what extent is this possible given the current situation? And how can the climate change research community help?

One place to start is to expand the interactions between climate change researchers and rural communities so that the former provide the latter with information consistent with spatial and temporal scales used in rural community planning. Rural residents are clearly interested in this initiative. Given the very nature of daily life in rural and resource-dependent communities, their residents are in many ways more appreciative of changes in environmental conditions and the risks associated with them than those who live in cities or suburbs. Residents are pragmatic in their attitudes toward climate change: if it is something that can be planned for, then it should be. However, they also see climate change as just one of many factors that must be considered in long-term rural community planning, and climate change-related risks must be weighed in relation to (and not in isolation from) other risks that will have to be managed over the long term.

This pragmatism is understandable. Increasingly fewer people in developed countries today live in rural and resource-dependent communities, and those who do are often falling behind urban residents in terms of the availability and accessibility of critical services and infrastructure. Any phenomenon that might threaten to further undermine the quality or viability of life in their communities, such as climate change, will be taken seriously. A critical question for the majority who do not live in rural or resource-dependent communities, yet who tend to be the ones that have the greatest influence over higher levels of government, is whether they want small, rural and resource-dependent communities to continue to exist and to thrive in the future. It will ultimately be urban residents who determine if the critical needs identified above – building linkages across levels of government, adapting constrictive institutional structures and regulations, and providing small communities the resources to act as full partners in planning – will be achieved.

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