

# Assessing Community Capacity to Adapt to a Changing Climate: A “how to” Guide for Communities

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# Community Capacity to Adapt to a Changing Climate: A “how to” Guide for Communities<sup>1</sup>

## Introduction

Every day each one of us does things that we don't notice that changes the climate. It's hard to believe that our day-to-day habits whether at home, at work or in our communities could be part of a global problem. Whether it is driving our car or truck to get to work, turning up the thermostat to run our electric baseboard heaters or the gas furnace to get warm, using our computers to do our work or entertain ourselves, buying food to stay healthy, or flying to sunny locations to relax, do business, or to see family to nurture our important relationships, we now know from strong scientific evidence that we are changing the climate in ways that will make the weather more changeable, extreme and uncertain.

We contribute to climate disruption as individuals, but even more so through our social choices, including how our electricity is made, how our industries use energy to make the products and services we rely on, and how governments direct land-use planning, building codes, equipment, appliance and vehicle standards, and natural resource management.

Everyone has something to contribute to lowering our contributions to climate disruption, but we also have something to contribute to reducing our vulnerability to a changing climate through other habits we might not notice. We build, buy or rent homes and offices in flood prone areas. Our community leaders and business leaders locate wastewater treatment plants, factories and other important infrastructure in areas that will be affected by sea level rise, salt water intrusion, storm surges, coastal erosion and flash flooding. We use plants and trees for food and forest products produced from monoculture operations that are increasingly vulnerable to pests due to warming temperatures. We live and work in buildings needing reinforcement because they might not be strong enough to take increased loads from intense rain and snow events. We lack emergency preparedness plans to help us be safe in extreme weather events that cause extended electricity blackouts affecting, heating, cooling, and water pumping. We are not prepared for or attentive to the need for back up food and water supplies on reserve in our homes and communities.

In our various roles as consumers, citizens, professionals, elected representatives, government officials, and business entrepreneurs we can pursue solutions that shrink the carbon pollution disrupting the climate. In doing so, we can make our homes and communities less vulnerable to changes in the weather that are now inevitable. In this

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<sup>1</sup> This workbook adapted from: Teitelbaum, S., Beckley, T. M., & Nadeau, S. (2007). *Community capacity assessment: A "how to" guide for communities*. Fredericton: University of New Brunswick.

workbook, we share tools a community can use to identify the assets that can be mobilized to adapt to climate disruption in ways that help citizens and communities thrive as we make the transition to a carbon free world. Before we get to that, however, we describe what climate disruption and climate adaptation are about.

## **Climate Disruption**

If our energy comes from burning oil, coal and gas we are adding greenhouse gases like carbon dioxide, nitrous oxide and methane to the air. If we manage our crops and forests in ways that disturb the soil or remove trees by cutting more than we plant we add carbon dioxide to the air. If we use fertilizers made from fossil fuel products like natural gas we add nitrous oxide to the air, a very powerful greenhouse gas. If we let organic garbage like food, wood and paper wastes ferment in landfills we release methane another potent climate disrupter. Nitrous oxide and methane are also emitted through manure and livestock management practices. All together these kinds of human-induced activities are generating more carbon pollution than the natural system can absorb.

The result of these human activities is that we now have concentrations of climate disrupting greenhouse gases in the atmosphere that are higher than they have been in the last 800,000 years (Intergovernmental Panel on Climate Change, Core Writing Team, Pachaur, & Meyer, 2014). In very simple terms, carbon pollution traps heat radiating from Earth's surface leading to global warming. According to the Intergovernmental Panel on Climate Change (IPCC), "warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen" (Intergovernmental Panel on Climate Change, et al., 2014, p. 2).

With more heat and water in the air (because 71% of the Earth is covered by water, more heat leads to more evaporation leaving more moisture in the atmosphere), we are seeing changes to climate like more intense precipitation events, changes to ocean and air currents, dryer and wetter conditions in locations subject to wetter or dryer conditions, more exposure to new and more numerous weeds, pollens, and pests, and increased intensity of forest fires and storms. The IPCC warns that "continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks" (p. 8).

In New Brunswick, we are seeing changes today from a warming world and the resulting changing climate. The province's most recent climate plan update summarizes the current and expected changes affecting New Brunswick from climate disruption: (*New Brunswick Climate Change Action Plan: 2014 - 2020*, 2014):

- Rising temperatures (already 1.5 degrees over past century; 1.1 degrees of that in last 30 years). We can expect an additional 3 to 3.5 degrees warming over next decades.
- Longer, warmer summers; shorter winters causing:
  - More ice jamming;
  - Stress to cold water fish species; and
  - Increased risk of forest fires.
- Changes to season timing affecting frost-free dates and winter recreation/tourism.
- More extreme rain events (defined as 50 mm in 24-hour period):
  - Fredericton/Moncton in 2000s experienced more extreme rainfall records than in any previous decade on record;
  - More intense rainfall per precipitation event, less snow and more rain over time, strong winds;
  - Flooding low-lying areas and soil and coastal erosion causing:
    - Road closures;
    - Homes/businesses damaged: sewage/storm water; and
    - Power outages: winter/summer effects (p.3).

The situation is serious, but we have options: we can work together to help change our energy system and the way we practice agriculture and forestry. We can work together to make our homes and communities safe from a changing climate through actions that reduce our vulnerability and show that we care for others.

### **Adapting to a changing climate**

July 5, 2014 may go down in history as the day that Atlantic Canadians came to understand the implications of a changing climate. On that day, with winds of 110km/hour and with 170mm of rain, post-tropical storm Arthur knocked power out across the region leaving more than 100,000 citizens and tourists without power for up to 10 days in some regions. This power outage followed a blackout due to an ice storm in December 2013 that lasted nearly as long affecting almost 90,000 customers in New Brunswick (<http://www.cbc.ca/news/canada/new-brunswick/arthur-hits-maritimes-post-tropical-storm-causes-widespread-blackouts-1.2697339>). These December and July storms had people talking about the weather, scrambling to find drinking water, to find a place to shower, to find generators to buy to provide back-up power, to find ways to get gasoline for their cars because gas pumps that relied on electricity weren't working, and to protect their food from thawing and rotting. With first responders and NB Power overwhelmed, citizens and communities realized that they had to find rely on themselves and each other to manage.

Events like post-tropical storm Arthur are consistent with what climate scientists tell us we should expect to happen more often and for which we need to prepare. Other events that help us think about what a changing climate might mean in our region include spring and

winter related flooding such as what St. Stephen and the Keswick Valley experienced in 2010, or that Perth Andover experienced in 2012. Northern New Brunswick faces land, home and infrastructure losses due to coastal erosion in places like Laméque. The challenges that a changing climate bring are different in various parts of the province. Some of these challenges are predictable, some are less so, but in either case there is much more we can do to prepare.

The Atlantic Provinces have come together to help communities adapt to climate change through the creation of the Atlantic Canada Adaptation Solutions hub (<http://atlanticadaptation.ca/>). A number of tools are available to help communities assess their climate vulnerability, including a primer for small communities using a 7-step approach to assessment (Newfoundland and Labrador, 2012):

1. Identify the types of climate and weather-related issues that have affected your community;
2. Locate where these issues have occurred or could occur in your community;
3. Assess what infrastructure has been or will be impacted;
4. Identify the residents who have been or will be most affected as well as those who can provide assistance in the community;
5. Assess which economic sectors have been or will be most impacted by the issues;
6. Identify how the natural environment have been or will be affected; and
7. Determine the best ways to address the issues identified.

Communities are using tools like this one to develop climate change vulnerability assessments (See resources list in Appendix 2). It is critical that communities complete these kinds of risk assessments to identify the biophysical changes that can be expected to affect infrastructure and other important community assets. The focus, however, tends to emphasize the risks to economic and natural capital assets (Wilson-Forsberg & Ramsey, 2013), as you can see from the list above. Less common is having communities holistically evaluate the risks to social or human capital or their economic, natural, social, and human asset strengths that can be redeployed and reorganized (Reimer & Tachikawa, 2008) so communities thrive in the transition to carbon free and climate safe communities. Importantly, there is increasing evidence that a community's social and human capital may be just as or even more important to a community's capacity to adapt to change than economic and natural capital (Chaskin, 2001; Donoghue & Sturtevant, 2007).

Scholars as early as 1996 encouraged community planners and natural resource managers to use a community asset development model. The belief was that "by focusing on assets and capacities rather than needs and deficiencies, energy is directed toward opportunities at the community level...[that could] further strengthen community capacity to drive its own development" (McKnight & Kretzmann, 1996, p. 165). Subsequent research confirms that social capital measures such as leadership, collective decision-making, motivation, vision, and longevity of residence are important to community capacity (Donoghue & Sturtevant, 2007; Lovell, Gray, & Boucher, 2014; Mountjoy, Seekamp, Davenport, & Whiles, 2014).

This workbook is designed to help communities assess their community capacity more holistically and to identify community assets and strengths that will contribute to solutions related to climate protection and adaptation. Social and human assets such as knowledge, social networks, skills, and the vitality of voluntary organizations are just as important as economic and natural capital assets for stimulating desired community outcomes that make sense for people, the community, the climate and the future.

The Community Capacity Assessment tool can be used for more than responding to climate change. It can be used to help communities explore how to activate and mobilize community resources to respond to almost any opportunity or threat. Increasingly, community leaders and residents are recognizing the need to work towards the provision of a good quality of life for all members of a community, in the broadest sense. This includes everything from a quality educational system, ensuring opportunities for local democracy, a clean environment, recreational activities or simply ensuring safety on the streets. Taken together, these elements, including the economic, social and ecological well-being of a community are often referred to as community sustainability.

A community capacity assessment does not have to be a complicated exercise, and it is one that can be carried out by community members themselves or with assistance from local government, community organizations or planning groups. Increasingly, research groups, non-profit groups and governments participate in the creation of tools that can help communities design their own capacity assessments. This workbook explains the process of community capacity assessment, then describes how it relates to and complements climate change vulnerability studies and sustainable community plans, and presents a visual tool for depicting community capacity called the "capacity asset amoeba".

This workbook is intended for community residents, community and regional planners, and policy-makers who want to participate in community capacity assessment, and for those who simply want to learn more about the ways in which community capacity assessments can help monitor progress towards community goals, including climate protection and adaptation.

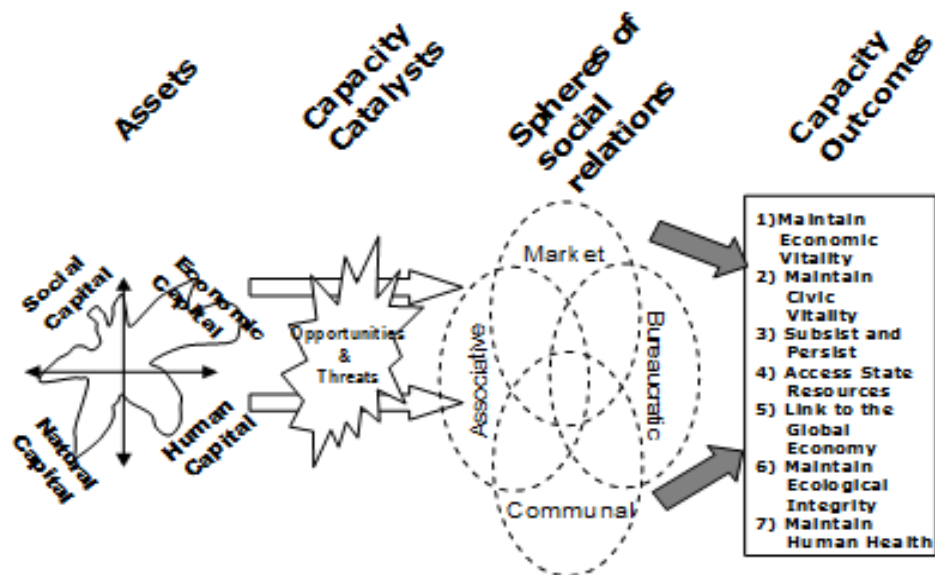
### **What is community capacity?**

We define community capacity as the “collective ability of a group (the community) to combine various forms of capital within institutional and relational contexts to produce desired results or outcomes. This definition involves distinct but related facets: (a) capital, assets, or resources; (b) catalysts; (c) mobilization of those resources through social organization and relationships; and (d) end results or outcomes” (Beckley, Martz, Nadeau, Wall, & Reimer, 2008, p. 60).



Put more simply, community capacity is the ability to get things done. Figure 1 summarizes the community capacity model described above. In thinking about the model, what's most important is to start with asking the question: the community capacity to do what? Looking at capacity outcomes in the last column in Figure 1 we can see that communities can respond to opportunities and threats by deploying their social, natural, economic and human capital using a range of social relationship tools (business relations through markets, government and institutional relations through bureaucracies, associative relations through group memberships and volunteer organizations, and communal relations through friends, neighbours and kin. We can aim to maintain, stimulate or establish economic and/or civic vitality, pursue sustainability, nurture human health and/or strive to adapt to changing climate and demands for energy and natural resource sustainability to contribute to climate protection.

## Assets, Catalysts, Relations, Outcomes



**Figure 1:** Community Capacity Model

*The Community Capacity Model is dynamic with social, economic, natural and human capital deployed in response to threats and opportunities using social relations to achieve desired outcomes (Beckley, et al., 2008).*

At the heart of the concept of community capacity is a focus on the transformative potential of communities themselves rather than a vision of communities as passive recipients of changes imposed from outside. Over the course of the 20<sup>th</sup> Century the reliance on various levels of government for services has increased. Some of these services provided by the state were good and necessary, such as health care, standardized education and transportation

infrastructure. At the same time, the increasing reliance on the state (provincial and federal governments) has reduced the self-reliance of communities.

Communities, however, do have social agency and the strength of that agency is associated with citizens' sense of community, level of commitment among community members and the ability to solve problems together, and to access resources (Chaskin, 2001). Work on community capacity has also been preoccupied with long-term sustainability or resilience of communities and a focus on the degree to which communities maintain control of their own fate in the face of internal and external stresses (Flora, 1994; Kusel, 1996; Markey & Vodden, 2000; Nettle et al., 2014). The idea of resilience has been central to climate change adaptation research. Scholars argue that self-reliance and the ability to influence and to adapt means to "influence how people help themselves; i.e., their empowerment" (Nettle, et al., 2014, p. 42).

Resilience is similar to concept of capacity as it emphasizes people's ability to take charge of local institutions to work toward a positive outcome for the community (Beckley, Parkins, & Stedman, 2002). According to Carpenter *et al* (2012), resilience in the context of environmental management and sustainability implies the capacity to absorb disturbance and reorganize so the system returns to or maintains existing functions, structures and services. Whether we are thinking of a social system like a community, or a natural system, like a forest, we can think of resiliency as the ability of the system to "take a punch" and bounce back to a condition near the pre-disturbance status quo. An important shift in orientation, however, emerges from the perspective of community capacity, which implies the ability to roll with the punches to generate new opportunities, functions, structures and services. Think of community capacity as the potential to manage change rather than maintaining a delicate equilibrium. Communities need to think about the dynamics of social change rather than the sources of stability like resource flows and jobs (Donoghue & Sturtevant, 2007). Responding to climate change will require system-wide changes to how we generate and use energy, to how we build and use infrastructure, and to how we keep our communities safe and generate business and employment opportunities. Attending to the factors that support community resiliency, as well as community flourishing are required; fortunately community assets can contribute to both resiliency and flourishing.

Adaptation is also related to the concepts of capacity and resilience: "a decision-making process and the set of actions undertaken to maintain the capacity to deal with current or future change and inclusive of an ability to manage resources" (Nettle, et al., 2014, pp. 40-41). The ability to mobilize resources can also be understood in terms of assets or attributes of groups, including leadership and self-organization. A feature that is common to many definitions of community capacity is the presumption that a community has numerous economic, natural, human and social resources, or assets, that can be drawn on to sustain community life and local economies. Conversely, there may be gaps or deficiencies in these same resources that limit a community's capacity to thrive. McKnight and Kretzmann (1996) refer to these assets as building blocks – a good metaphor because they are, in a sense, the component parts that create the structure of a community from the foundation on up.

Sustainability scholars working to account for natural resource consumption in the economic system first proposed redefining capital from “humanly produced means of production” to any “stock that yields a flow of goods or services” (Daly & Jr., 1989, p. 72). Over the next two decades, this expanded idea of ‘capital’ soon evolved to include at minimum four: economic, natural, human and social (Beckley, et al., 2008; Beckley, et al., 2002; Kusel, 1996). Economic capital refers to the physical and financial infrastructure that supports the economic and social activities of the community; natural capital refers to the goods and services delivered by the natural world; social capital refers to the will and ability of people to mobilize resources and work together and human capital refers to the education, job experience, acquired skills, health and mobility of individuals (Beckley, et al., 2002) (see Box 1).

#### Box 1: Four Types of Capital

##### Economic capital

Community economic capital comprises two types of assets physical and financial: 1) Physical capital or infrastructure sometimes referred to as fixed assets such as municipal, provincial and/or federal infrastructure, including roads, light rail and other public transit structures, bridges, piers/wharfs, potable water and wastewater treatment facilities, buildings and vehicles (city hall, police, ambulance, fire), and the physical capital associated with the fixed assets of the business community (stores, factories, tractors, boats, productive machinery, etc.); 2) Financial capital or liquid assets consists of the financial assets of the community (both public and private), covering municipal budgets (including municipal bond ratings, value of real estate and associated property tax revenue), individual and household savings, business cash flow and operating funds (Beckley, et al., 2008).

##### Natural capital

Natural capital refers to the ecological assets that a community has, such as forests, arable land, minerals, wildlife, clean air and water, etc. Historically, the only natural capital assets that really counted were those which were exploited in order to create commodities. Today, wealth is also generated by capitalizing on the amenity dimensions of natural resources, for example through recreation and tourism. Two forms of natural capital are differentiated as well: 1) natural resource endowments or stocks (that are often used for creating commodities), and 2) environmental services or processes such as the hydrologic cycle, the nitrogen cycle, etc. that provide us with clean water, air, oxygen, and other natural elements critical to our survival (Beckley, et al., 2008). Changes to a community’s natural capital resulting from a changing climate can affect tourism, fisheries, agriculture, forestry and water and air quality.

##### Social capital

Social capital refers to “social networks, norms of reciprocity, mutual assistance, and trustworthiness” (Putnam & Feldstein, 2004, p. 2) within and between groups. There are three dimensions to social capital (Marin, Gelcich, Castilla, & Berkes, 2012; Woolcock, 2001). Bonding social capital refers to the strong ties we have between family members, our ethnic

group, close friends, and neighbours. Think of bonding social capital as referring to our in-group and who we turn to in times of trouble, our safety net (who we rely on to get by). Bridging social capital, on the other hand, is more outward looking and refers to the weaker, more distant and diverse ties that we have with friends, associations, and colleagues in different communities and groups. We use our bridging social capital when reach out to colleagues to help us find a job or when our local government reaches out to a near-by community to solve cross-boundary transportation problem (how we get ahead; trade favours). Putnam calls bonding social capital “a kind of sociological superglue, whereas bridging social capital provides a sociological WD-40” (1995, p. 23) or social lubricant. Bonding and bridging social capital are ‘horizontal’ resources because they deal at the same level (friends to friends, groups to groups). The capacity to ‘go up’ to leverage resources, ideas and information beyond the community, to forge alliances with sympathetic individuals in positions of power is called ‘linking’ social capital. When the local mayor builds a relationship with the provincial ministers of local government, infrastructure and transportation, linking capital is being built. Communities rich in bridging and linking social capital are known to be more resilient , better able to manage resources and to solve problems and create opportunities (Marin, et al., 2012; Putnam & Feldstein, 2004). Importantly, to the consideration of the community effects of a changing climate is consideration of sense of place as a component of a community’s social capital (Moore, Severn, & Millar, 2006).

#### Human capital

This concept refers to the knowledge, skills and experience of individuals (Johnson & Stallman, 1994; Schuller, 2001). Unlike social capital, here we are talking about the individuals rather than groups or the collective. Human capital is developed through formal education, trade and technical training, life and self-provisioning, entrepreneurial, and leadership skills, and informal learning that occur within families, communities or work places (Beckley, et al., 2008). Important to the capacity to adapt to climate change is the need to determine which skills and talents need to be nurtured or re-introduced to meet community and economic opportunities emerging from the transition to a clean energy system and climate safe communities (Hopkins, 2011). Human capital as it relates to self-reliance is best exemplified by the old adage, “Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime.” The knowledge of how to fish is human capital.

The quantity and quality of assets or capital will differ from community to community. One community may be rich in natural resources but because of high population mobility, has a weak civic life or unstable community leadership. Another community may have plentiful services and infrastructure but due to a stagnating economy there are few families left to pay maintenance on them or enjoy them. Perhaps just as important as inventorying community assets across the four capitals is to assess how they combine in important and strategic ways. Climate adaptation analysis, with its current focus on resiliency, often highlights risks and vulnerabilities to economic and natural capital spheres. Human and social capital spheres, however, are critically important to a community’s capacity to not simply “bounce back from a blow” but to flourish. In the context of the potentially rapid change to our policies and

behaviours required to both slow climate change and to adapt to it, building and deploying human and social capital will be essential.

Social capital, particularly bridging and linking social capital that ties resources together across communities and up the decision-making chain to generate solutions is increasingly identified with community capacity to adapt to climate change (Carpenter, et al., 2012; Marin, et al., 2012). Carpenter *et al* (2012) defines a number of principles important to the capacity for general resiliency, the ability to respond to extreme and unexpected events, compared to specific resiliency, the capacity to respond to unpredictable, but previously experienced disturbances. Two principles, openness and nestedness are relevant to our discussion of community capacity. Openness, the strength of connection between neighbouring social-ecological systems, closely parallels the definition of resilience, but also bridging social capital. The need to interact hierarchically from the township, county, provincial, national, and global level to get things done parallels the definition of linking social capital.

With our understanding of the importance of community capital assets and considering climate change adaptation as our example catalyst, we can now consider how the spheres of social relations could come into play.

Whether responding to, or thinking about responding to, an opportunity or a threat, communities do so within established social relations. We deploy what we have, working with whom we know to get done what needs doing. Social relations can be grouped into four broad types but recognize that there is significant overlap between them. The four types of social relations that can be tapped when trying to get things done are: market, bureaucratic, associative, and communal relations. Important to note is that “each is associated with a set of norms, rights, and entitlements that guides the behaviour of those involved and establishes the context for expectations and social control that accompany them” (Beckley, et al., 2008, p. 68). Think of the relational spheres as normative: what are the rules and character traits that guide our social interactions. We want our business dealings to be fair and honest, we want bureaucracies to act in the public interest and to function according to their roles, we expect our associative relations to operate under the norms of equality, and we want our communal relations to operate with honour and loyalty (Reimer & Tachikawa, 2008).

According to Beckley *et al* (2008), market relations encompass exchange of goods transactions like labour (human capital), land (natural capital), capital (financial capital) that are important to the economy and production. Turning to local business entrepreneurs to tap skills and labour or buying or setting aside land to prevent flooding or fundraising for a new community hall are examples of market relations. Bureaucratic relations refer to working with people and institutions in their roles as regulators, law-makers, policy and political decision-makers. When we deploy community leaders to meet with the minister of local government, environment or natural resources, we are engaged in bureaucratic relations. Associative relations refer to those people and groups that collaborate on the basis

of shared values or mutual concerns and interests. We engage our associative relations when working with the local recreation association, historical society, faith and charitable organizations. Communal relations refer to the strong ties we have with people based on birth relations, ethnicity or location. We are using our communal relations when we turn to family and friends to take us in when the power goes out or we need a lift when the car breaks down or when a neighbourhood hosts a block party or fundraiser.

As mentioned above, these relational spheres overlap. If your community has three barbershops, but you patronize the one owned by a cousin, that represents an intersection between the communal and market spheres. When a local conservation groups organizes and successful gets a provincial minister to set aside Crown land in a reserve that represents an intersection of the associative and bureaucratic spheres. An entrepreneur obtaining credit from a bank to start or expand a business is an activity wholly contained in the market sphere, but it that same entrepreneur obtains loan guarantees from a province, that represents a market sphere, bureaucratic sphere interaction.

Community capacity assessment not only provides an opportunity to identify capital assets and associated strengths and weaknesses, catalysts, and social spheres or relations, it can also help point to latent capacity that is not currently used, but that could potentially be mobilized to achieve collective goals. Also, by engaging in a community capacity exercise more than once (for example on an annual or 3 to 5-year cycle), a community can monitor its progress towards achieving agreed community outcomes or goals and allow participants to see how things have changed over time. Importantly, the very process of bringing people together to assess community capacity builds capacity.

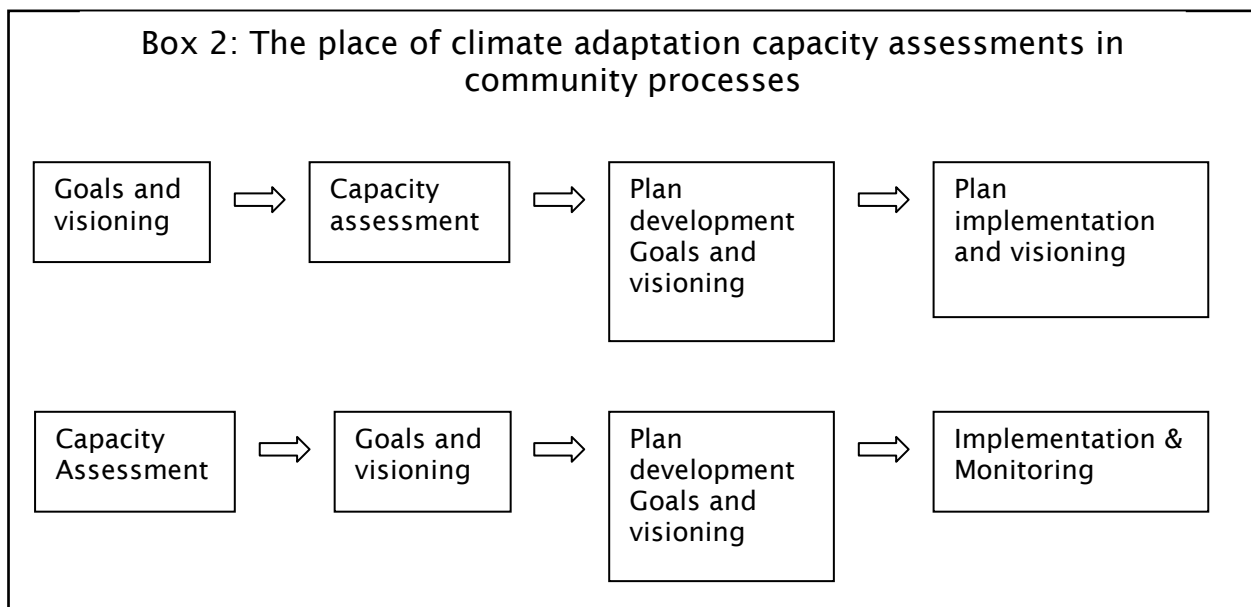
### **How to undertake a community capacity assessment?**

A community capacity assessment can support multiple community objectives. This workbook emphasizes assessing the capacity to adapt to a changing climate, but it is not necessary to see the process or the outcomes as distinct from other community priorities like economic development or sustainability. In fact, a holistic approach that aligns community environmental, social and economic goals is the strongest base from which a community can flourish in the long-term.

With respect to our climate change focus, it is important to recognize that doing a climate adaptation capacity assessment is only one stage in a locally driven community exercise that will also need to consider local needs for community development and sustainability. Understanding a community's vulnerability – the sensitivity and susceptibility to harm and lack of capacity to cope and adapt to climate change (Field et al., 2014, p. 5) – is only one input into the overall capacity assessment. To understand the community capacity to respond to a changing climate, a community also needs to understand how the “social characteristics of the community and external social forces influence the capacity to reduce exposure or modify the sensitivity to climate change and its related impacts or hazards”. From this perspective community capacity is the “capacity to respond by modifying the social

norms, behaviours and policies to anticipate or reduce the risks from climate change” (Fischer, Paveglio, Carroll, Murphy, & Brenkert-Smith, 2013, p. 360).

Box 2 demonstrates the potential for a holistic approach where climate change adaptation integrates into a communities overall goals and vision. In addition to completing a community assessment there is a need to create a community plan, and a strategy for implementation and ongoing monitoring of progress toward agreed goals. This workbook deals only with the capacity assessment phase. However, we do discuss the importance of monitoring indicators over time.



In the remainder of the workbook we summarize the steps a community should consider taking to complete a community capacity assessment.

**Step 1: Identifying leaders to form or activate a group**

A group of people or team is needed to lead and facilitate the capacity assessment process. This may be the same group that is involved in a wider community development strategy, or it may be a smaller, select group (a sub-committee, or a group that is identified to have particular skills or access to data). The group could be a municipality, local service district, civic, environmental or other not-for-profit organization, a technical committee, private consultants, local citizens or any combination of the above. What is essential is that the group has some knowledge of the community. It is preferable to have a group that is representative of the diversity of the community. It is also important that the team include individuals who can carry out tasks important to completing the assessment (library skills and computer literacy to collect secondary data for indicators, basic mapping or geographic information systems to assist the community explore sense of place, interview skills for

soliciting community input, etc.). Involving local citizens in the group is essential not only because local residents know how to locate information and resources in their community, but because they can also bring valuable local knowledge to the process and provide context to discuss observed trends. The best experts about any given community are the people that live there. Sometimes the most effective groups are partnerships that involve local people with regional development or agency staff with an awareness of resources and data that may be useful in creating a capacity profile.

The coordinating group should establish a process for community engagement either through existing or new processes and whether through occasional workshops or established processes. Box 2 clearly envisions citizen engagement even if a smaller group is formed to manage the community capacity assessment process.

## **Step 2: Undertaking a community assessment**

### ***Determining the scope of the assessment***

A crucial step in community capacity assessment is to agree on the purpose behind the assessment and the long-term goals or desired outcomes for which the assessment is being undertaken. Is the assessment focused on climate adaptation in its narrowest sense (biophysical or infrastructure risks and responses), or is the assessment focused on a long-term vision for the community of which the capacity to respond to a changing climate is but one factor. The question of focus relates back to the models described in Box 2. An assessment can be designed to look only at specific sectors of activity (climate impact risks to tourism) to see how they can be improved, or it can be conducted to report on various spheres of activity in the community (a holistic approach to reducing the risks associated with a changing climate that also enhance the community's capacity for long-term social, economic and environmental viability. The scope of the assessment will depend, in large part, on how the group envisions community change at this point in time. The broader the vision, the more likely one will be to design a broad assessment. While the capacity assessment itself does not automatically lead to change, if done periodically (e.g. monitoring) it can help to assess progress toward community goals.

Box 3 provides examples of desired community outcomes relating to climate change adaptation. Once desired outcomes have been identified, they should guide the design of the specific assessment framework.



**Box 3: Examples of Desired Community Outcomes from  
Climate Change Adaptation Capacity Assessment**

- Maximize community safety from exposure to extreme events like wildfires, floods, drought, storms
- Sustain economic livelihoods dependent on fisheries, forestry, agriculture, tourism
- Diversify community development opportunities in response to changing requirements for clean energy, sustainable forestry, agriculture and fisheries
- Enhance social and natural capital to increase community capacity to adapt to a changing climate
- Enhance education and life skills to support climate change adaptation

***Designing an assessment framework***

Once there is agreement on why the assessment is being conducted, the next challenge is to design an assessment framework to guide collection of community profile and process information. Profile information refers to measurable indicators that describe conditions in a given community. They are more descriptive as in unemployment rate, value of property, air quality, and education attainment. Profile indicators are more quantitative measures of economic, natural, human and social capital. Process information is more qualitative and refers to what people do rather than whom or what they are. Process indicators can help explore how things came to be the way that they are and what needs to happen next for things to be different (Beckley, et al., 2002). Process indicators are more often subjective measures of things like quality of leadership, volunteerism, entrepreneurship and sense of place but can also include measures of density of community relationships and perceptions of well-being. Process indicators relate mostly to social capital.

In this part of the assessment process we are identifying indicators associated with capital assets: economic, natural, social and human. Three major questions need to be answered here:

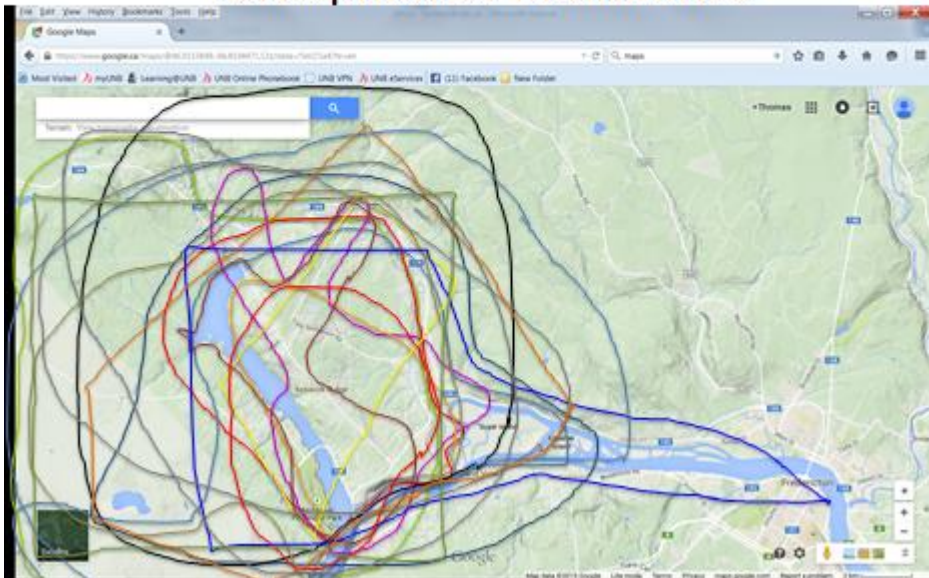
1. What is the scale of the assessment (how is the community defined)?
2. What information is needed to assess the situation and measure progress toward agreed goals?
3. Where can profile and process indicator information be found?

The following sections discuss each of these steps in more detail.

## Choosing the geographic scale

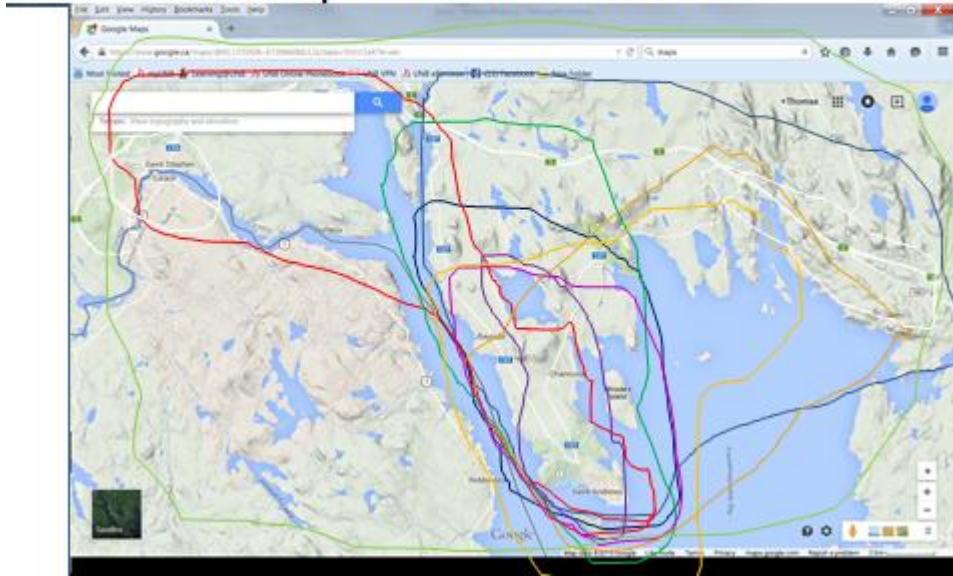
We have referred to *community* capacity assessments, but we haven't defined community. In its simplest form, community is defined as "an association of interacting people" (Moore, et al., 2006, p. 365). That's a pretty broad definition and one that needs some clarity as a community set off to complete a community capacity assessment. It might be natural to define a community by geographic or political boundaries, but citizens rarely engage with their community in this way. A person's sense of place, or the community they feel an affinity for, may cross geographic and political boundaries and have implications for achieving goals, particularly climate change adaptation requiring alignment in communication and execution of emergency preparedness plans. Figures 2 and 3 demonstrate the complexity of citizens' sense of place. In two workshops piloting the community capacity model's value to climate change adaptation we asked participants in Keswick Ridge and Saint Andrews, New Brunswick to draw on a map the community they felt an affinity with. We then compiled everyone's contribution into one map to demonstrate the variations in peoples' sense of place.

### Keswick Ridge Perception of Boundaries



**Figure 2:** Sense of Place Keswick Ridge  
Results of community boundaries exercise: draw the Keswick Ridge you feel an affinity for.

## Saint Andrews Perceptions of Boundaries



**Figure 3:** *Sense of Place Saint Andrews*

*Results of a community boundaries exercise: draw the Saint Andrews you feel an affinity for.*

Clearly, citizens have a much broader perspective on their sense of community than would emerge from a strictly geographical or political boundary definition. In addition to considering citizen perspectives on their definition of community, it is important to consider the scale appropriate to implementation of any plan emerging from any community capacity assessment. If data is available, a community may want to focus on collecting baseline data for community-related assets most associated with specific goals that have been identified. In addition, some information for smaller communities, for example, may only be available at the county scale. For Keswick Ridge, most Statistics Canada data covered the census subdivision of Bright in which Keswick Ridge is located.

It is important to choose the scale appropriate to the needs of the group doing the assessment, but also to be flexible using data readily available and adapting it to those needs. At the larger scale capacity assessments may be done at the county/municipality, for an administrative unit such as a forest district or regional service district, or even on a watershed basis. As demonstrated by Figures 2 and 3 citizen sense of place mapping exercises can help identify “functional” units, not merely the standard administrative units. For example, there may be a boundary between a rural municipality and an incorporated town or village. The administrative boundary may have very little effect on resident patterns of social interaction, service acquisition, natural resource base, and other variables that are considered in a capacity assessment.

As noted, it is not always possible to match the available secondary data to desired scale of analysis. In Canada, census divisions and subdivisions correspond more closely to actual communities, but again, some aggregation of census subdivisions may make the most sense for conducting a capacity assessment. Such a strategy, for example, would encompass the natural capital (e.g. a forest) and the economic capital (e.g. processing infrastructure, such as a newsprint mill) that exist between a rural region and a small town – separate census divisions, but a region with functional interdependencies between the smaller units. Thus it is important to verify with Statistics Canada what is available for the region where the assessment is being conducted.

There are obviously trade-offs with different approaches. Watershed assessments may make the most sense for the achieving goals with regard to resource management or water protection, but it may be difficult to collect data for such a unit as watershed boundaries rarely correspond to census boundaries. In recent years there has been growing interest in choosing ecologically defined units of analysis rather than administrative units, and efforts are being made to collect socio-economic data that correspond to watersheds or forest planning districts.

### ***Choosing indicators***

Once the geographic scale of the assessment has been determined, the obvious question is - "what do we measure?"

Most capacity assessments rely on an indicator approach. Indicators are simply variables or data that can be measured to show trends. If the focus is on measuring things that change over time, it is important to choose variables that vary. In other words things that change in meaningful time scales. In some cases, indicators portray the state of community assets or capital. For example, you may identify "greater entrepreneurship" as a desired outcome for the community. Indicators of this type could include anything from education attainment levels, to the number and success of local businesses, to opportunities for mentorship through business associations or a chamber of commerce (see Box 4 for examples). In other cases, indicators might be chosen that demonstrate relational aspects of community life (networks). Indicators of this type could include anything from density of relationships, number of volunteer organizations or levels of trust. Indicators can be further described as either quantitative (associated with a numeric value such as computer ownership or education levels), and qualitative (descriptive of a situation such as perceptions of community safety and quality of leadership).

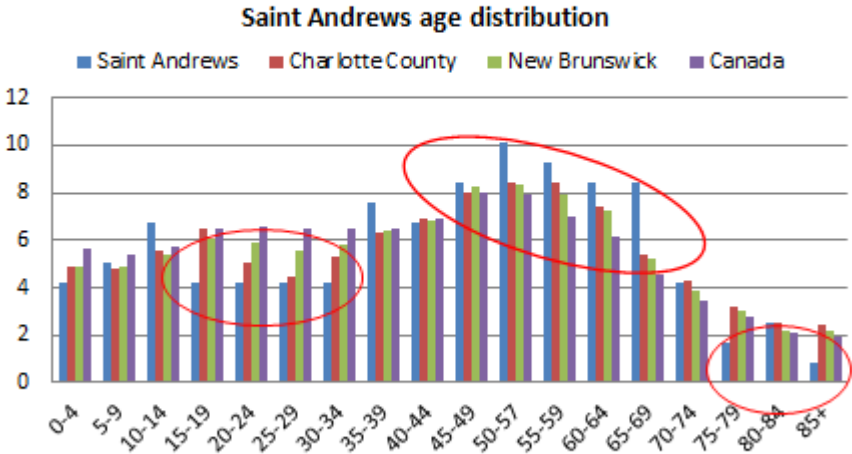
Indicators are most effective, however, when they can be compared across time and space. It is therefore necessary to determine what types of comparisons you wish to make with your indicator results. Are you interested in tracking capacity to adapt to climate change in your community over time, which would require systematic re-appraisals at chosen intervals of

time? Or are you interested in comparing your community to other ones in the region, which requires that the same information be available for many communities.

Just as it is important to understand citizen perspectives on sense of place, it is important to garner community consensus on a set of indicators that will be used to establish baseline and to track progress toward the community’s agreed vision and goals relating to climate change adaptation (or more broadly community development or sustainability of which climate change adaptation is a critical component).

With respect to data collection, assessment teams should consider that it might be relevant to collect information on specific subgroups within communities. For example, while average age of the population can be an interesting indicator, it misses important nuances. Figure 4 demonstrates that reporting only average age may mask the fact that Saint Andrews is overrepresented by people aged 45 to 69 and unrepresented by people 15 to 34 and 75 and older. As well, variables need to be looked at together. If there are high average incomes, men are the predominant wage earners, and marriage statistics show a high and stable level of married couples (low divorce rate), that may mean there is a large pool of women that are able to contribute to the voluntary sector in that community. From a climate change adaptation perspective, the much older residents (75 and above) may be less comfortable using new energy technologies or with leaving their homes in the event of an extreme climate event; they may be more isolated requiring special attention from first responders. However, the over-represented group in their later working years or in the early years of their retirement may bring skills to solving climate adaption or climate protection challenges that younger residents can learn from.

## Age Distribution: Older Population: Issues?



**Figure 4: Population statistics Saint Andrews**

Using Statistics 2011 census data to compare age distribution in Saint Andrews, New Brunswick to its county, province and country, the community can explore potential strengths and weaknesses arising from an older community population. Older residents may be less comfortable using new energy technologies or with leaving their homes in the event of an extreme climate event; they may be more isolated requiring first responder attention. An older population may also bring skills to solving climate adaption or climate protection challenges that younger residents can learn from.

There are many examples of community assessment that can provide a list of indicators to start from. However, it is important to take the time to figure out which of these is suited to your specific situation, which new ones are needed and where the data will come from. Box 4 provides a starting list of indicators of economic, social, physical and human capital(Beckley, et al., 2008).

<b>Box 4: Indicators for Community Capacity Assessment</b>	
<p style="text-align: center;"><b>Economic Capital:</b></p> <ul style="list-style-type: none"> <li>- Property tax revenue</li> <li>- Municipal infrastructure</li> <li>- Personal savings</li> <li>- Income</li> <li>- Value of real estate</li> <li>- Municipal bond rating</li> <li>- Number of businesses</li> <li>- Stability and success of businesses</li> <li>- Emergency preparedness infrastructure</li> <li>- First Responders infrastructure: fire, policy, ambulance</li> </ul>	<p style="text-align: center;"><b>Social Capital</b></p> <ul style="list-style-type: none"> <li>- Extent of barter</li> <li>- Participation at events</li> <li>- Number of voluntary associations</li> <li>- Bridging social capital</li> <li>- Bonding social capital</li> <li>- Density of acquaintanceship</li> <li>- Social networks</li> <li>- Public health networks</li> <li>- Health care</li> <li>- Trust</li> <li>- Voting levels</li> </ul>
<p style="text-align: center;"><b>Natural Capital</b></p> <ul style="list-style-type: none"> <li>- Forest resources</li> <li>- Soil resources</li> <li>- Energy resources (renewable/non-renewable)</li> <li>- Amenity values (aesthetics)</li> <li>- Mineral resources</li> <li>- Wildlife resources</li> <li>- Water quality</li> <li>- Air quality</li> <li>- Biodiversity</li> <li>- Ecosystem services</li> </ul>	<p style="text-align: center;"><b>Human Capital</b></p> <ul style="list-style-type: none"> <li>- Population profile</li> <li>- Education attainment</li> <li>- Dependency ratio</li> <li>- Quality of leadership</li> <li>- Quantity of leadership</li> <li>- Life skills</li> <li>- Trade and technical training</li> <li>- Entrepreneurship</li> <li>- Creativity</li> <li>- Self-provisioning skills</li> </ul>

From a climate change adaptation perspective data collected to populate indicators listed in Box 4 would be interpreted through the lens of which capital assets should be deployed toward adapting to a changing climate, which assets are at risk, which can be strengthened to meet the needs, opportunities and challenges associated with the climate change impacts profile for at given community.

Box 5 summarizes some of the factors to consider in choosing indicators to set baselines and to track change over time. It is important that indicator data be credible. If the community can't collect primary data use credible sources of secondary data like Statistics Canada or provincial agencies (see Appendix 1). An indicator is meaningful when it is relevant to the change you are trying to track and can show change over time. Practical data is available and affordable data. Indicator is valid when it is accurate, at the right scale and provides information everyone can understand.

**BOX 5: Criteria to Evaluate Indicator Quality and Appropriateness** (adapted from (Mirbach, 2003)

**Credibility and Meaningfulness**

- Relevant → Does the indicator tell us something meaningful about community capacity to positively respond to the need for climate protection and adaptation to a changing climate?
- Reliable → Is the indicator relatively free from “noise” when it comes to interpreting data and positive and negative climate protection or climate adaptive change over time?
- Responsive → Is the indicator capable of tracking responses to community, government, institutional action?
- Sensitive → Is the indicator sensitive to change so that it will show trends over time?
- Predictable → Can future indicator levels be predicted with reasonable accuracy?

**Practicality**

- Available → Is data for this indicator currently available?
- Affordable → Can data be compiled or collected at reasonable cost?

**Validity**

- Measurable → Is the indicator measurable at sufficient accuracy and at an appropriate scale?
- Understandable → Is the indicator's relevance understandable to an informed, non-technical reader?
- Cost-effective → Is the cost of measurement justified by the value of information it provides?
- Commitment → Is there sufficient commitment to continue monitoring and reporting on this indicator?

### ***Gathering the indicator data***

There are many ways to go about documenting the indicators you have selected for your assessment. One option is to use data that has previously been collected (secondary data). Some situations may require that the assessment team collects new data (primary data). Another decision is whether to rely on quantitative data that provide you with a factual picture of a situation, or qualitative data that will allow you to have a more descriptive and in-depth understanding of a situation – or a combination of the two. These decisions will depend on the objectives of the assessment, the availability of resources (time, money, expertise) and the strength and weaknesses of each type of data. The following sections briefly discuss the differences between quantitative and qualitative data as well as the pros and cons of secondary versus primary data.

### ***Choosing quantitative or qualitative data?***

Traditionally, quantitative data has been favoured in portraying community capacity. It is important not to be too captivated by numbers or the perception that indicators delivering numeric data represent the best way to understand a community's capacity. In fact, research shows that "adaptive capacity is probably best assessed with process [or qualitative information]. In the case of climate change, process information can explain the capabilities community members and institutions exhibit in the areas of learning, decision-making, and collective action. Process information is also important to understanding how trust, mutual understanding, social beliefs, values and behaviours translate into adaptive actions" (Fischer, et al., 2013, p. 361).

Process information provides context and can be collected through interviews, observation, workshops, study circles, any number of ways where people's thoughts, feelings, perceptions can be collected. Study circles are popular in Sweden where 10 to 15 people representing a cross-section of the community meet weekly for one to two months with the guidance of a facilitator to address community issues (Wilson-Forsberg & Ramsey, 2013).

Qualitative data can be categorized and counted, but it also can be shown visually in ways that other data cannot. Figure 5 shows the results of interviews completed in advance of a community workshop to explore how community capacity assessment could contribute to climate change adaptation. The interviews explored citizen perspectives on their communities, what they liked and disliked about their communities, their level of trust in local institutions and their neighbours, and the kinds of activities they participated in. Interviewer questions and words were removed from the transcripts and then the Word documents were analysed using qualitative analysis software (NVivo) to create the word cloud in Figure 5. The number of times a word was mentioned determines the size of the word in the word cloud. Clearly community was a topic of conversation. In the case of these particular interviews, interviewees believed that people were the most important community asset.



## What We Learned: Interviews



**Figure 5:** Word Cloud Keswick Ridge

Interview transcripts can be analysed using qualitative analysis software like NVivo to create a word cloud. In this case, residents of Keswick Ridge were interviewed in advance of a community capacity assessment working exploring the tool's value to climate change adaptation. The interviews covered questions about community volunteerism, people's sense of trust in whom and in what, what they liked and disliked about the community and what they thought the community's greatest assets were. Clearly, community and people were considered important assets.

While collecting qualitative data can be more time consuming than collecting quantitative data, it provides essential contextual information essential to assessing a community's capacity to adapt. Quantitative data can be more readily available than qualitative data. It is also often easier to interpret and is more comparable across time and space. Another advantage of secondary quantitative data is that it is often less expensive to obtain data to measure compared to primary, qualitative data. Many international and governmental agencies such as the United Nations rely on statistical indicators to track and compare the socio-economic progress of the world's nations. Some researchers have described these sorts of indicators as *profile indicators* (Beckley *et al.* 2002). Profile indicators are good for creating a portrait at a fixed point in time and in making comparisons to baseline data.

Qualitative data allows for a better understanding of the underlying causes of community processes. Beckley *et al.* (2002) call these indicators *process indicators*. They often have more explanatory power with respect to why things are the way they are. For example, you may have two communities with a similar level of recreational amenities (parks, ball fields, rinks, etc.), however, one community may have achieved this through large contributions by a single large employer in the community. The second community may have achieved the same level of services through resident organized fund-raisers, broad participation within the community and sweat equity (donations of time and labour). The profile indicator looks the

same in each community (e.g. a similar recreational amenity infrastructure), but the process whereby that condition came to be is very different, and these differences may have implications for community capacity. For this reason, profile and process indicators are most powerful when they are used to complement one another. The issues surrounding community capacity are more complex than whether or not a community has the necessary amenities and services – it is also about the quality of these services, the way people work together and collaborate to develop these services. Those aspects are difficult to assess based only on numbers and more relevant information can be collected by letting people express themselves through various qualitative data collection methods. The drawback to qualitative data is that they are usually collected from a smaller number of people, targeted for the perspective they can provide on a specific topic and the findings are therefore often less generalizable to the whole population.

A holistic approach is to mix quantitative and qualitative data. This can provide a more well-rounded portrait of a situation as it presents both the facts, and some evidence to explain the numbers and the particular challenges/opportunities the community faces in this area (Markey & Vodden, 2000; Nadeau, 2002; Parkins & Beckley, 2001).

### ***Use existing data or collecting your own?***

Many organizations already collect data on various aspects of community life that may be useful for your community capacity assessment. Using secondary data is an inexpensive method to gain valuable information and although not all data are free, you will not have to bear the cost of data collection and analysis.

Some organizations, such as Statistics Canada, have a standard procedure for data collection at the community or regional level, which facilitates comparison between communities. In some cases, you might also find out that the information you are interested in has been collected regularly over many years, allowing you to document trends over time.

There are enormous possibilities to access existing data. At the national and provincial level in Canada there are a variety of government ministries and departments that may have useful information such as Statistics Canada, Environment Canada, or provincial departments of Public Works, Finance, etc. Municipal and local governments are worth looking into as well. Then there are many non-governmental organizations both at local, regional and national levels such as universities/colleges, business associations and conservation groups which may collect their own statistics (see Appendix 1).

A drawback of secondary data is that, because you played no part in its design, you may not find exactly what you are looking for and be forced to settle for a proxy measure. For example, government records may only report on voting rates for the county rather than the community level as you would like, therefore you will have to extrapolate from a larger population. Also, most secondary data are quantitative and therefore won't provide you with any explanation or background on the numbers. While other documents may provide some

of this background, here again you will be limited by someone else's interpretation of the situation.

The advantage of primary data is that you are in charge of designing the process that will lead to data collection thus you can ensure that the information collected is exactly what you need for your assessment. By tapping into local knowledge and perceptions, for example through key informants, surveys or focus groups, it is possible to gather a wealth of information about important local issues such as the quality of leadership in the community, the strength of social networks and the type and variety of social organizations. A drawback however, is that you are also assuming the cost of data collection and analysis, which can be prohibitive. Also, primary data tends to be less easy to compare with other sources of data and unless you start a monitoring program, you may not have data to follow the evolution of indicators over time. For this reason, it is probably a good rule-of-thumb to explore sources of secondary data before embarking on your own data collection exercise.

Some of the commonly-used methods for collecting primary data include:

#### Key Informant Interviews:

This involves interviewing people in the community who are knowledgeable about the particular topic in which you are interested. These interviews should be able to provide in-depth information on particular aspects of community capacity you are exploring. The drawback is that while you may have very detailed information from a few people, the results will be less generalizable to the entire population. As well, it is important to consider any conscious or unconscious biases that interviewees might hold and to adequately address these by obtaining information from multiple sources. For example, if you are interested in resource stocks (such as fish), you can interview scientists and managers of resource agencies, as well as the people who have been fishing for several decades. You might get varying opinions on fish stocks. As well, you can compare these data with quantitative, historical data such as fish landings, or value of shipments over the past 20 years. This is called triangulating the data. If all your sources agree, there is no conflict. If there is wide disagreement, you may have to do more research to make a determination as to the most reliable sources.

Interviews can be either structured (the questions are determined beforehand) or unstructured (a free-flow type of conversation). Keep in mind that interviews may need to be wholly or partly transcribed, which can be labour intensive and thus a costly process.

#### Survey Questionnaire:

This is an opinion poll of a sample of a target population. Such a survey can be structured in a variety of different ways; either with open-ended questions yielding narrative responses, structured questions with a numerical rating system or simple yes/no types of questions. The advantage of a survey is that you can get broad-based and representative data on issues related to community capacity. However, photocopies, distribution and collection can make it a costly alternative. As well, data coding, cleaning, analysis and interpretation can also be

costly and time consuming. Communities might want to consider getting some professional help with a survey as it is easy to inadvertently write a survey instrument that leads respondents toward desired responses.

#### Workshops/Focus Groups:

Focus groups bring together a group of people familiar with your subject and leading a discussion. This discussion aims to solicit the views of these people on your subject. The discussion can be semi-structured. Participants are encouraged to interact and share ideas.

#### Participant or non-participant observation:

This technique requires the investigator to spend time in the community observing phenomenon of interest to the study of community capacity. This could cover watching how first responders deal with extreme events or how public health and emergency preparedness agencies interact. In participant observation the investigator interacts with the people being studied while in non-participant observation the goal is only to observe without significantly interacting. This method requires that some time is spent with the research subjects, in order that they begin to accept the presence of the investigator so there is minimal change in the normal behaviour of residents.

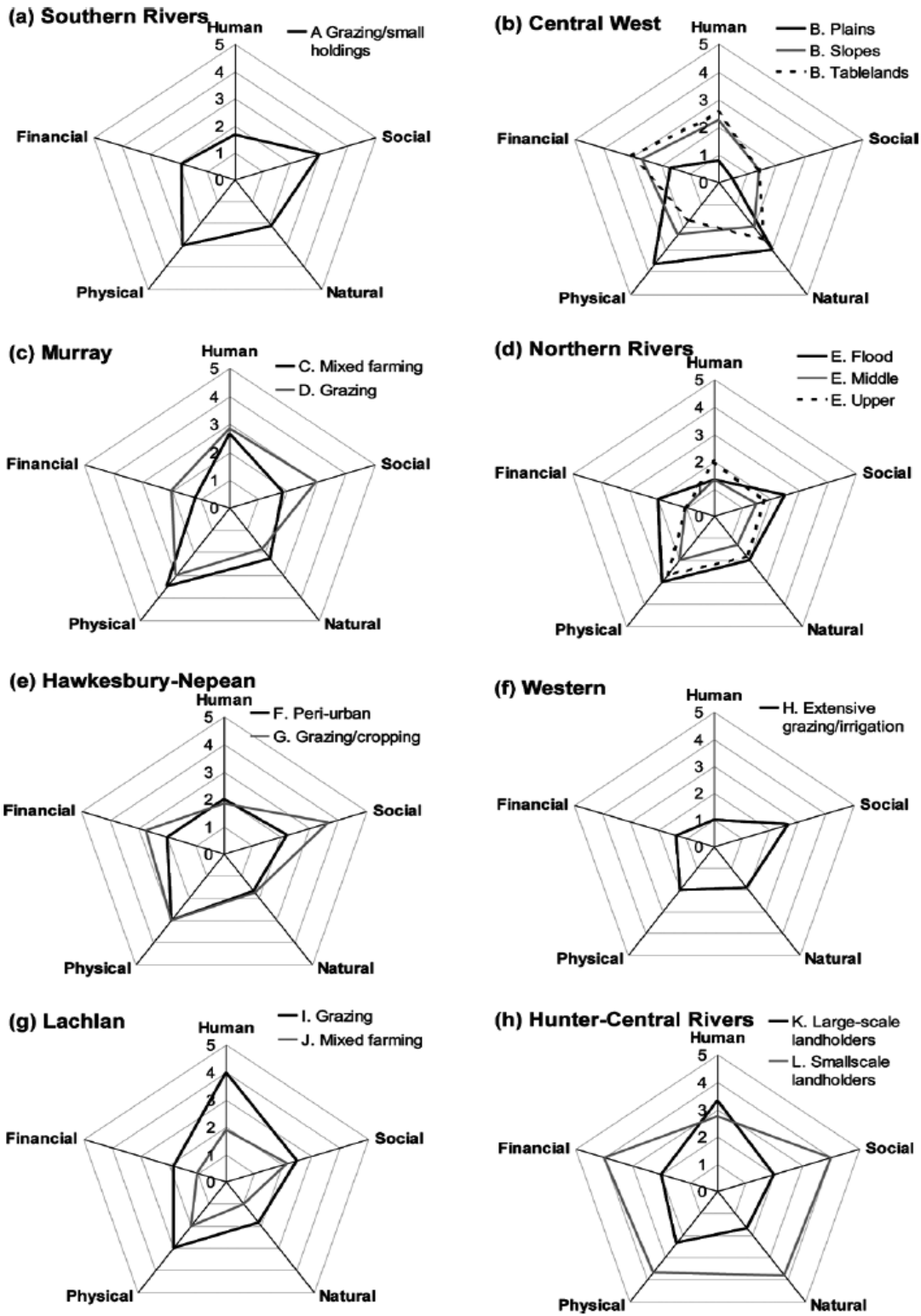
#### **The capacity asset amoeba: A visual tool**

Once the indicator data has been collected, it should be tabulated and presented in a way that is both comprehensible and accessible. There are a number of ways to do this – via graphs, charts, tables, or through narrative descriptions. Sometimes maps are useful for certain types of data. Different people respond to visual presentations of data differently, so it is perfectly appropriate to repeat some indicator data in multiple formats (text, tables, and charts, for example).

Usually, these sorts of tools deal with one indicator at a time. Another tool for presenting a large amount of data in one graph is called the "capacity amoeba". It is a vector diagram, divided into quadrants that represent various assets of a community. In the natural sciences, the approach uses vector diagrams to compare the health of ecosystems, communities or populations at two points in time or under real and ideal conditions (Cato, tens Hallers-Tjabbes, & Bijlsa, 1989; Smit et al., 1998).

In the capacity amoebas, each indicator result is plotted on a 4-way axis using one scale (for example 0 to 10). Each "pie slice" represents an individual variable, and will be longer or shorter depending upon its value. The resulting diagram has an irregular shaped border that makes it look something like an amoeba. An advantage of this tool is that allows for the integration of different kinds of measures (e.g. environmental and economic) in the same graphic without having to reduce them all to the same unit of measurement. However the lack of uniformity of measurement also means that amoebas are difficult to interpret in isolation. Instead two or more similar amoebas must be constructed comparing a given community at time 1 to time 2, comparing a desired state to the current state or comparing

one community to another. The amoeba therefore allows a community to monitor progress towards given objectives or to compare its current state with that of another community. Amoebas are also useful, however, for just stimulating community discussion about a community's strengths and weaknesses. Figure 7 provides an example of how asset amoebas can be used.



**Figure 6:** Capacity assets amoebas New South Wales  
 The capacity of private landholders in New South Wales, Australia to manage natural resources was explored in this study with results presented showing asset amoebas. A livelihoods approach was used to enable land

managers to define, describe, and evaluate locally relevant indicators of natural resources management capacity. (Leith, Jacobs, Brown, & Nelson, 2012).

An asset amoeba can also be created using a more subjective approach. Figure 7 is an example of how workshop participants can subjectively assess the state of community assets. Figure 7 shows four indicators selected from the possible set of social capital indicators. Charts like this were used to have workshop participants rank their assessment of economic, natural and human capital indicators. Together, workshop participants were asked to think about what they believe the state of the four capital stocks is (economic, natural, social and human). Figure 7 shows one (social) of the four charts completed by workshop participants piloting the community capacity tool to explore climate change adaptation. In this case, participants were asked to provide their personal assessment on a scale where one is poor and five is excellent the state of particular social indicators. It is important to provide a base from which respondents are making their assessment: a measure from a base year (i.e., ten years ago) or from the condition they wished it would be.

## Capital Assets Exercise: Social

<p>BRIDGING SOCIAL CAPITAL (LINKS TO KEY OUTSIDERS)</p> <p>1    2    3    4    5</p>	<p>BONDING SOCIAL CAPITAL (SOCIAL CONNECTIVITY W/IN COMMUNITY)</p> <p>1    2    3    4    5</p>
<p>PARTICIPATION AT COMMUNITY EVENTS</p> <p>1    2    3    4    5</p>	<p>NUMBER OF VOLUNTARY ASSOCIATIONS</p> <p>1    2    3    4    5</p>

**Figure 7:** Subjective social capital assessment results  
Workshop participants can rate on a scale where 1 is poor and 5 is excellent their subjective perspective on community assets like social capital.

Figure 8 the how the subjective assessments were compiled into an asset amoeba.

# Subjective Amoeba



**Figure 8.** Subjective capital asset amoeba Saint Andrews  
 Workshop participants subjectively assessed Saint Andrews, NB as having excellent amenity assets, but lower soil and water quality assets; infrastructure was in good shape, but business success was considered weaker.

These capacity amoebas represent one way of quantifying the collective subjective judgements of a group of citizens. Amoebas can help citizens understand the value of collecting and tracking data in a way that visually changes over time. The exercise can be followed up with quantitative data that can then be compared to subjective perspectives. Importantly, areas of weakness and strength can be identified for their potential contribution to climate change adaptation, goals can be set for moving community's in the direction they feel that they need to go and then to track progress toward those objectives over time.

## Conclusion

Community capacity assessment is a general approach for taking stock of community assets or monitoring progress towards community goals. It involves both tools and ideas for gaining an understanding of where a community is and where it wishes or needs to go. We believe that it is a tool ideally suited to assisting communities in assessing options for adapting to climate change, including both the solutions and adapting to its impacts. The tool has value in bringing to light the importance of social and human factors in supporting the change process and to motivating action. Although there is no single recipe for undertaking a capacity assessment, we have introduced the key concepts and suggested processes for ensuring community engagement and participation in undertaking a community capacity assessment aimed at enhancing the chance of successful adaptation to a changing climate



that supports community flourishing. Appendix 1 and 2 provides links to resources for community data collection in Canada and climate change adaptation resources.

## **Appendix 1: Sources for secondary statistical data in Canada**

### Federal government

Many government agencies collect data for policy needs and much of this information is made available to the public. Some like Statistics Canada can provide information on many sectors (economy, social, cultural) while other agencies only collect data that are relevant to their specific area of expertise. Some examples of ministries, departments and agencies to investigate include: Agriculture and Agri-Food Canada, Canada Mortgage and Housing Corporation, Canadian Environmental Assessment Agency, Environment Canada, Health Canada, Human Resources Development Canada, and Industry Canada.

### Statistics Canada:

This government agency provides statistics on many aspects of Canada's life (employment, population, industry, agriculture, economy). The National Household Survey reports community level data. [www.statcan.ca](http://www.statcan.ca)  
<http://www12.statcan.gc.ca/nhs-enm/index-eng.cfm>

### Provincial governments:

Provincial government departments also collect data, for example health departments, finance departments and natural resource departments. Some provinces even have their own statistics bureaus. It is a good idea to contact local offices first as they might be able to provide you with the information you need.

Department of Natural Resources

[http://www2.gnb.ca/content/gnb/en/departments/natural\\_resources/services.html](http://www2.gnb.ca/content/gnb/en/departments/natural_resources/services.html)

Department of Environment and Local Government

<http://www2.gnb.ca/content/gnb/en/departments/elg/services.html>

Department of Energy and Mines

<http://www2.gnb.ca/content/gnb/en/departments/energy/services.html>

Department of Agriculture, Aquaculture and Fisheries

<http://www2.gnb.ca/content/gnb/en/departments/10/services.html>

Department of Post-Secondary Education and Labour

[http://www2.gnb.ca/content/gnb/en/departments/post-secondary\\_education\\_training\\_and\\_labour.html](http://www2.gnb.ca/content/gnb/en/departments/post-secondary_education_training_and_labour.html)

### Municipal governments:

Municipal governments may collect data on issues of municipal importance such as water and sewage, population mobility, green space, voting rates, business and construction permits.

#### Universities and research organizations:

Check universities, colleges and research organizations in your area for possible research institutes, projects, or professors in relevant areas.

#### Local organizations

Local groups should be able to provide useful information both on their own activities, revenues, membership and may also collect information about other aspects of community life. They may also be a good source for key informants. Examples include:

1. public institutions and organizations

Various formal institutions are likely to collect data on local trends about public security (fire, police department), health (hospital, home care, health departments), education (school boards).

2. non-governmental organizations

These include churches, civic organizations and clubs, social service organizations, recreation organization, historical societies, industrial and professional organizations (chamber of commerce, business development) environmental organizations, local newspapers, historical societies

3. informal social groups and organizations

These are groups which may not have an official status but are active in community life. For example neighbourhood groups, user groups (hikers, hunters).

## **Appendix 2: List of other climate change adaptation assessment and capacity tools**

Responding to climate change in New York State: the ClimAID integrated assessment for effective climate change adaptation

<http://www.nyserda.ny.gov/climaid>

Community vulnerability assessment of climate change and variability Impacts in Charlotte County, New Brunswick

[http://www.ecwinc.org/new/wp-content/uploads/2014/12/ECW\\_CCCVA\\_Final\\_2014.pdf](http://www.ecwinc.org/new/wp-content/uploads/2014/12/ECW_CCCVA_Final_2014.pdf)

Local Government, Sustainability and Climate Change

[http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/Municiple\\_Guidebook\\_English\\_Sept\\_2012.pdf](http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/Municiple_Guidebook_English_Sept_2012.pdf)

Atlantic Climate Adaptation Solutions

<http://atlanticadaptation.ca/>

<http://atlanticadaptation.ca/new-brunswick-communities>

<http://atlanticadaptation.ca/sites/discoveryspace.upei.ca.acasa/files/updated%20binder%20with%20Shea.pdf>

Federation of Canadian Municipalities climate change adaptation resources

<http://www.fcm.ca/home/issues/environment/climate-change-adaptation/adaptation-resources.htm>

Natural Resources Canada: Climate change adaptation resources

<http://www.nrcan.gc.ca/environment/impacts-adaptation>

Stockholm Resilience Center

<http://www.stockholmresilience.org/21/research/research-news/3-5-2015-learning-to-apply-resilience.html>

International Institute for Sustainable Development

<http://www.iisd.org/adaptation/>

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