

Chapter 2

Coastal Communities in Atlantic Canada

Abstract The population sample of 10 small rural coastal communities in Atlantic Canada is described, spanning the provinces of Québec, New Brunswick, and Prince Edward Island. Interviews of 74 people (both singly and in couples) were completed in 2011–2012 soon after the 2010 winter storms and another one was also done in 2014 as part of a follow-up survey. The focus of this chapter is to highlight the characteristics of the participants in this research, including demographics, such as gender, age, education, and occupation, which are outlined. Generally, more men than women were sampled (33 men and 22 women). The age range of interviewees was 26–90 years, with women commonly 45–54 and men with an older age range of 55–65 years old. Some traditional occupations for these communities are represented by fishers and farmers. Most of the participants resided at the coast all of their lives, with only a couple relocated there within the past 5 years at the time of interview.

Keywords Rural communities • Demographics • Sex/Gender • Age • Occupation

Coastal communities around the world are sensitive to climate change, particularly to sea-level rise and storm surge that could lead to flooding and erosion, posing a risk to people, buildings, and infrastructure. Atlantic Canada is no different and small communities there are vulnerable to changes in sea level and storm action, including high waves associated with storm surge, coastal flooding, erosion, and shoreline change. In Atlantic Canada, rising mean sea level is amplified by widespread crustal subsidence (Forbes 2008). The vulnerability of coastal communities increases due to more people occupying the coastal zone and associated rising property value in the face of poor and uneven adaptation (see Forbes 2008). According to the authors, vulnerability is affected by the timing and effectiveness of adaptation as well as coping capacity. Places that are located at low elevations are especially susceptible to sea-level rise and flooding. Atlantic Canada is normally not at risk from tropical cyclones, but can be affected by storm activity linked to hurricane activity further south along the eastern coast of North America. “Killer storms,” for instance, have appeared in the North Atlantic and are known to track

closer to the coast, where sea-surface temperature has increased (Scheibling and Lauzon-Guay 2010). In addition, in Atlantic Canada, winter storms are more frequently impacting coastal communities due to the lack of sea surface ice, which tends to protect against high waves in the winter. Damage can be more important than during the hurricane season, as blocks of ice with waves can really damage buildings and infrastructure along the coast. It is known that vulnerability to tropical storm impacts is also affected by socioeconomic variables, as for instance inequitable resource distribution that can be overcome through income diversification, reduced poverty, common property, and collective security (Kelly and Adger 2000). This means that an integrated approach (social, economic, and environmental) is required to scrutinize climate change adaptation and sustainability.

Small rural communities situated at the coast of Atlantic Canada need to be studied in terms of their vulnerability and response to climatic change affecting the coastline. In this study, participants were interviewed either singly or in couples in their spoken language of either English or French. Based on interviews in 2011–2012, and subsequently in 2014, their experiences of coastal storms and the 2010 winter storms, in particular, were examined through the use of various questions that will be outlined in later chapters. Not all participants responded to all questions, however, so that the sample size varied.

Because their responses are the basis for the findings of this study, it is important to take into consideration the individual characteristics of the participants. Demographics, for instance, will be considered and outlined next in this chapter. However, it is worth noting that demographics do not exclusively affect individual outlook and individual/social behavior; and other variables should also be considered as well as religious beliefs (faith in an afterlife or divine intervention), which may bolster a sense of responsibility and instill a need for action (Hope and Jones 2014). Indeed, it has been suggested (Lyle 2015) that a more targeted approach to climate change adaptation involves knowledge of factors, circumstances, and historical factors affecting decision making and hierarchical systems in this process. In particular, the author brought to light the role of individual beliefs and risk perceptions as being central to such a hierarchy.

2.1 Demographics

Participants in the provinces of Québec (QC) and New Brunswick (NB) reported being significantly affected by the 2010 winter storms. By comparison, respondents in Prince Edward Island (PEI), especially women, responded more often “No” to whether they had been affected by the 2010 winter storms (Table 2.1). Women in PEI were particularly unaffected by the 2010 storms. For this reason, the focus will be on the other provinces (QC and NB).

The majority of participants were professionals as well as in male-dominated occupations, such as primary producers and the trades (Table 2.2). Women had a similar range of occupations than men, with a total of 59 occupations listed for

Table 2.1 Summary of (%) participants affected by the 2010 storms

Overall (N = 67)	Female	Male	Couples	Total
Yes	13.4	32.8	4.5	50.7
No	16.4	29.8	3.0	49.2
Total	29.8	62.6	7.5	99.9
QC (n = 17)	Female	Male	Couples	Total
Yes	23.5	41.2	0.0	64.7
No	5.9	23.5	5.9	35.3
Total	29.4	64.7	5.9	100.0
PEI (n = 10)	Female	Male	Couples	Total
Yes	0.0	20.0	0.0	20.0
No	50.0	30.0	0.0	80.0
Total	50.0	50.0	0.0	100.0
NB (n = 63)	Female	Male	Couples	Total
Yes	12.7	34.9	4.8	52.4
No	9.5	31.7	6.3	47.5
Total	22.2	66.6	11.1	99.9

Table 2.2 Occupational codes of participants (counts) affected by storms

Province	Female	Male	Couples
Overall	Business/financial (5) Professional—biologist (3) Education (3) Public servant (2) Professional— environment/conservation Professional—food engineering Professional—health Professional—psychology Professional—social worker Trade	Public servant (9) Trade (7) Primary producer (7) Business/financial (5) Professional— environment/conservation (3) Education (2) Professional—biologist Professional—computers Professional—environmental science	Education (2) Primary producer Trade
QC	Business/financial (2) Education Trade	Public Servant (3) Education Professional—environmental science Business/financial Trade Primary producer Professional— environment/conservation	

(continued)

Table 2.2 (continued)

Province	Female	Male	Couples
PEI	Professional—biologist Professional— Environment/conservation Business/financial Public servant	Professional—biologist Trade Professional—computers Professional— environment/conservation Primary producer	
NB	Professional—biologist (2) Business/financial (2) Education (2) Professional—food engineering Professional—health Professional—psychology Public servant Professional—social Worker	Public servant (6) Primary producer (5) Trade (5) Business/financial (4) Professional— environment/conservation Education	Education (2) Primary producer Trade

those participants who had experienced storms. Most participants held volunteer/community positions and some (15%) were retired. At the regional level, the territory appeared to be multifunctional in terms of economy.

2.2 Discussion

The age range of participants who had previous experience with storms was 29–90 years. For females, the most common age range was slightly lower (45–54) than for men (55–64). In Canada, Atlantic Canada has the oldest population (Vasseur and Catto 2008), with the majority of residents occupying coastal communities (Rapaport et al. 2015). Age is an important determinant of response for various reasons, including different modes of media accessed by the elderly versus students, for instance, to obtain information about severe storms (Silver and Conrad 2010). They may, for instance, check media to access advisories and information regarding storm characteristics in order to assess their own risk (Dow and Cutter 1998). Elderly people are vulnerable to climate-related hazards, and this will increase with projected aging populations in developed countries around the world as well as aging infrastructure on which we depend (Oven et al. 2012). In countries like South Korea, for example, older age groups are more vulnerable to meteorological disasters, including typhoons (Myung and Jang 2011).

Similarly, other factors make groups vulnerable, such as social and cultural discrimination as part of the “sociocultural dimension” (Lambrou and Nelson 2013), as for instance affecting youth (Overton 2014). Due to a lack of education or employment opportunities, isolated coastal communities often experience an “exodus” or out-migration of youth. This situation exacerbates the conditions, where

less tax revenues limit the capacity of the communities to develop adaptation plans and better infrastructure. In such circumstances, elderly people are also leaving in order to be closer to healthcare centers. Marginalized groups, including women and the poor (Denton 2002) as well as children/the aged, disabled, and indigenous people, etc. (Dominelli 2013), are missing opportunities to prepare for climate change impacts and have the least capacity for representation and negotiation (Demetriades and Esplen 2008). It is, therefore, important for their social networks to be considered when developing strategies to overcome barriers (Messias et al. 2012). Those with a circumscribed adaptive capacity are more vulnerable to the shocks and stresses associated with climate change impacts (Polack 2008). Rather than depending on an elite group for their survival (Wong 2009), the poor should have improved access to resources in order to be able to respond effectively on their own. Women are similarly affected due to their roles (family and work) and access to resources (Alston 2013). In Nepal, for example, inter-caste dependencies as well as gender inequalities are affected by adaptation processes (Onta and Resurreccion 2011). In rural India, their ability to access resources affects women's vulnerability (Roy and Venema 2002; espoused by Tschakert 2012 as part of political ecology). Even in our communities, most women tended to be at home or working in more precarious conditions than men (Vasseur et al. 2015).

Occupation is a vital consideration because of its impact on income and poverty. It has also been linked to the preferred adaptation strategies used by men and women during floods and droughts (Codjoe et al. 2012; Tatlonghari and Paris 2013). Typically gender-specific occupations, such as fishing (Weeratunge et al. 2010), farming, and charcoal production (cf. Codjoe et al. 2012), can limit adaptation. It is not only their occupation that affects women's adaptation, as increased female employment (Godden 2013; and whether or not they are employed or paid for their roles, cf. Vasseur 2016) can determine their adaptation to climate change impacts. Women have been found to be more vulnerable than men because of their income and education (cf. Enete 2013), which, in turn, according to Liu et al. (2014), affect their knowledge and perceptions of climate change. Gender, and not age, has been found to significantly shape risk perception (Safi et al. 2012); however, others have attributed gender and education as well as age as affecting risk perception in NB (e.g., Lieske et al. 2014). Research has conveyed the influence of age on opinions regarding climate variation, but other variables have also included religion and educational level (Teka et al. 2013).

Examples from around the world portray women's vulnerability to climate change. Women have suffered more flood risks (e.g., sexual harassment) than men in Vietnam (Tu and Nitivattananon 2011). Household income and gender are known to affect concern over the societal impacts of heat waves in Adelaide, Australia (Akompab et al. 2013). In Australia, there is increasing gender-based violence in cases of drought, for example, where there is income-related stress (Whittenbury 2013). However, more studies are needed that examine local adaptive strategies (Djoudi and Brockhaus 2011; Reed et al. 2014; Sultana 2014 for multiscalar research investigating gender and social relations). To illustrate this idea, Ketlhoilwe (2013) reports that the main adaptive strategies employed by women

include the integration of local knowledge as well as new technology and social interaction leading to social learning. Women's networks and their capacity-building determine the impacts of environmental change on them (Makhabane 2002). Their role to maintain community cohesion has been observed (e.g., Vasseur 2016), even though they may not receive any direct income for performing these roles. Where women are isolated, as for example confined women in Bangladesh; and they are more affected by climate change impacts, which poverty and health also impound (Shabib and Khan 2014).

Women are generally more trusting of face-to-face communication and where information is received from people that they know (Alber 2013). This makes sense, especially in light of experiences associated with Hurricane Katrina, where data convey nationally did not always reflect local experiences (Anthony and Sellnow 2011). Data communicated through various streams, including radio, television, and the Internet are considered to be trusted sources of information, and can be deployed to enhance preparedness and education as well as inform resilience strategies (Burger 2015). Information acquired by women are from diverse sources and quality; for example, it could be information that they attained through their multiple roles in the household and communities that can be used to warn of impending disasters and prepare for them (Ross-Sheriff 2007).

The manuscript by Vasseur et al. (2015) represents one of the few published studies to investigate the effects of gender on experiences and perceptions of winter storms in Atlantic Canada. The authors have conveyed the demographics already outlined above; in addition, they revealed some aspects of gender-based experiences and perceptions. For example, both men and women experienced similar impacts as a result of storms, particularly flooding (see their Table 2, p. 12523). However, women tended to refer to flooding at home, whereas men mentioned flooding of roads and infrastructure. Women also mentioned damage to their personal belongings. The gendered experience was also affected by sex-typical occupations, as for instance male fishers and farmers. This latter point affected the male response to erosion, with eroded farmland affecting farmers.

The gender-based division of labor that is evident in these small rural communities points to gender roles affecting the experiences and perceptions of men and women in Atlantic Canada. In addition, it is also crucial to examine age-related impacts, especially as 15% were retired in this study sample. Age can affect mobility and adaptability, which can affect evacuation and responses to storm-related effects and hazards. These aging communities will respond in more traditional ways and convey patterns associated with traditional gender roles, as for instance women responding closer to home rather than in the overarching social domain over immediate community connections. Evacuation is likely to become more important as a climate adaptation strategy for vulnerable communities (Kuhl et al. 2014), but elderly people may be unable to do so and, therefore, would be more at risk.

Problems arising from income-based limitations set by occupation and employment status (that could also be affected by gender as well as age demographics and education), could slow down recovery as well as trigger higher impacts and affect risk; as for example for low-income women, who are at greater risk

than others (cf. Ajibade et al. 2013) and, thereby, more vulnerable and less resilient to flooding. Likewise, fishers with more fishing-gear investment and government support can adapt occupationally as well as through networks (family, fishers' groups, etc.); conversely, their adaptation (in, e.g., Mozambique) is hindered by limited assets and declining resources, competition, and poverty (Blythe et al. 2014). In addition, the diversification of occupation (or livelihood diversification, Goulden et al. 2013), along with an improved economy and sense of community (or "community coherence"), all act to reduce vulnerability and enhance resilience, as to storm surge in Iceland (Geirsdóttir et al. 2014).

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