Societal Adaptation to Environmental Change in Inuvialuit Communities: Meeting the Needs of Northern Residents

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Introduction

Inuit communities in the Canadian Arctic are susceptible to changing environmental conditions which affect their culture, their economy, and their environment. Climate change is pronounced at high latitudes, and many northern communities have already identified changes which are affecting their traditional livelihoods. This project develops the human dimensions of the environmental change issue by assessing the vulnerability of coastal infrastructure in Inuvialuit communities to environmental change. Notwithstanding the resilience and adaptability of northern peoples, there is concern that the scope and speed of changes are stretching the capacity of communities to adapt.

Recent work in the field of adaptation to environmental change has shown the importance of identifying environmental attributes that are pertinent to the community, especially climatic variability and extremes. Furthermore, the community's vulnerability is influenced not only by its exposure to changing conditions (climate, social and economic), but also by its ability to cope. This coping ability (or adaptive capacity/resilience) is related to economic, social, and institutional resources as well as to other stresses which contribute to the environment within which decisions are made.

Study Area: Tuktoyaktuk, NWT

Tuktoyaktuk is the most northern community located on the Canadian mainland (69'27'N, 133'02'W), with a population of approximately 1000 people (Figure 1). It is located on Kugmallit Bay, and in the summer is only accessible by air or boat. During the winter access via the ice road is possible. Tuktoyaktuk is a major shipping port in the Canadian Arctic, and continues to be heavily influenced by the petroleum industry. However, the majority of the community still relies on subsistence-based activities.

Figure 1: The Inuvialuit Settlement Region.

Figure 2: A traditional smokehouse.

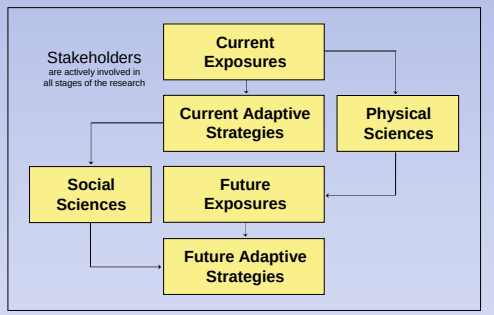

Figure 3: Methodological Framework.

Research Approach

This project examines the interactions between community and environmental change as it relates to coastal infrastructure. The research employs social science methods, including semi-structured interviews, focus groups, a review of secondary document and records, and inputs from natural science (Figure 3). The practical aim is to help Inuvialuit communities identify means of adapting to environmental change, thus reducing their vulnerability, through the identification of community-relevant policy procedures.The active involvement of the community at this early stage is a *key ingredient* to the success of the research itself.

Vulnerability

The vulnerability of a community is a function of its exposure to environmental change, and its ability to adapt to those exposures.

$$V_{ist} = f(E_{ist}, A_{ist})$$

Where V = vulnerability, i = community, s = stimulus, t = time, E = exposure, and A = adaptive capacity (Smit and Pilifosova, 2003). Therefore, the vulnerability of a community at a certain point in time is a function of its exposure to a certain stimulus and its ability to adapt to that stimulus (Figure 4).

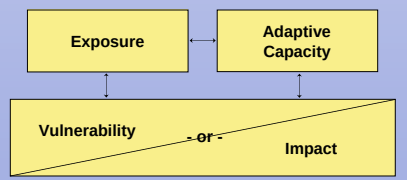

Figure 4: Potential feedbacks on community vulnerability.

Coastal Infrastructure

Specifically addressed in this research project will be the vulnerability of coastal infrastructure to environmental change. Current and future exposures are based on certain physical criteria associated with the coastal zone system (Figure 5).

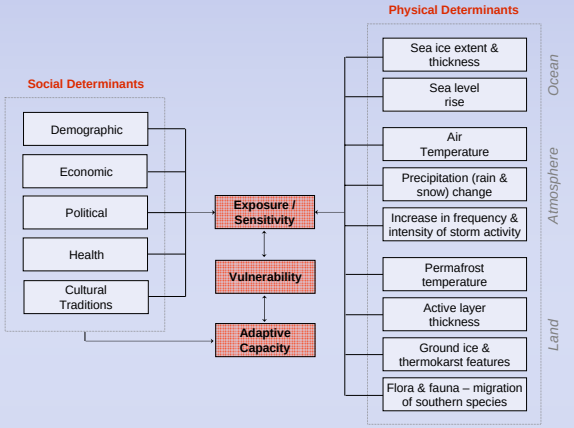

Figure 5: Physical criteria that may aid in the definition of potential vulnerability of northern communities to environmental change.

Extensive research has been conducted in Tuktoyaktuk, NWT to assess current and future coastal changes (Solomon and Covill, 1995; Solomon and Gareau, 2003; Manson *et al*., 2005; Solomon, 2005). This information on past vulnerability and adaptation measures will be examined to suggest future adaptive strategies.

Significance

Insights into the nature of vulnerability and the experience with adaptive strategies will be compared among communities, to identify lessons to assist decision-makers in dealing with rapid changes in Canada's Arctic regions. This project will contribute to ArcticNet Theme 4.2 – Reducing Human Vulnerability to Environmental Changes in the Canadian Arctic, and Theme 2.4 – Climate and Coastal Landscape Instability: Socio-economic and Ecological Impacts.

Acknowledgements

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