Modelling Governance Structures and Climate Change Policy Communications on Community Resilience in the Canadian Arctic

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Abstract: The Government of Canada recognizes that climate change is now unavoidable making it imperative to help Northern Canadians adapt. There is evidence of adaptive capacity as local communities are forced to adjust; however, these adaptive strategies tend to be reactive and localized in nature. There is therefore an increasing need to develop integrated regional climate change policies. I argue that an ecological health approach based on complexity modelling can inform climate change policy in the Canadian Arctic. I propose a two-phase institutional mapping procedure in order to identify and understand multiple stakeholder perspectives or ways of knowing about climate change resilience. A key problem is to understand how – in particular, *indigenous knowledge* is currently integrated into climate change policy-making about the Canadian Arctic. I propose two interrelated projects: 1. systematic 'mapping' of institutional structures with climate change policy agendas aimed at enhancing community resilience in the Canadian Arctic; and 2. a communication model illustrating how indigenous knowledge and climate change policy information 'flows' between members of these climate change policy networks.

Keywords: indigenous knowledge; institutional mapping; communications modelling; climate change policy; Canadian Arctic

1. INTRODUCTION

Circumpolar regions, including the Canadian Arctic, are facing accelerated warming due to climate change. Northern dwellers and in particular, Inuit, are faced with fundamental shifts in a 'way of life' that has been synonymous with adaptability to the cold. The Government of Canada [2010] recognizes further climate changes are now unavoidable making it imperative to help Northern Canadians adapt. There is evidence of adaptive capacity as local communities are forced to adjust, for example, by switching from traditional to store foods [Ford et al., 2010]; however, these adaptive strategies tend to be reactive and localized in nature. There is therefore an increasing need to develop integrated regional climate change programs that work across scales to incorporate both traditional and scientific approaches to climate change adaptation [Adger, et al., 2005].

Increasingly, researchers are seeking out indigenous sources of knowledge about what

adaptation strategies are best suited to a changing northern environment. For example, Krupnik and Jolly's [2002] edited volume, "The Earth is Faster Now", is dedicated to reporting indigenous observations of Arctic environmental change. What is unclear is how findings from these indigenous knowledge studies are being integrated back into climate change policy-making, especially at the regional level. An ecological health approach (Ecohealth), promoting overall human and environmental wellbeing, is adopted as the main conceptual framework for this proposed study.

In collaboration with a growing network of climate change policy stakeholders interested in Inuit knowledge, I propose a two-phase research project aimed at modelling regional to territorial to national institutional communications about indigenous knowledge, climate change, and health. This project will therefore focus geographically on the four regions of the Inuit Nunangat including: the Inuvialuit Settlement Region (Northwest Territories), Nunavut, Nunavik (Northern Quebec), and Nunatsiavut (Northern Labrador) [Inuit Tapiriit Kanatami (ITK), 2010]. Understanding *how to include* indigenous knowledge in policy-making about the Canadian Arctic will advance help close the Arctic climate change adaptation research-policy-practice gap.

1.1 Conceptual Framework

An Ecohealth approach offers a lens through which complexities inherent in climate change policy-making can be better understood by considering the interplay between social, political, natural, and any other relevant systems (see Figure 1) [Berkes et al., 1998]. Kendrick [2003] explains how Ecohealth, as an action-learning approach, encourages the integration of multiple 'ways of knowing' through co-management of environmental issues such as climate change. A main goal of co-management is to identify and navigate between discrepancies over core values and beliefs about sustainability in human-environment systems. In this paper, sustainability refers to the health or resilience of a social-ecological system in terms of its vulnerability (i.e., ability to 'bounce back') to surprises such as extreme weather events. Parkes et al. [2008] argue that understanding and encouraging ecosystem health from a multi-stakeholder perspective will produce corresponding health benefits in human communities.
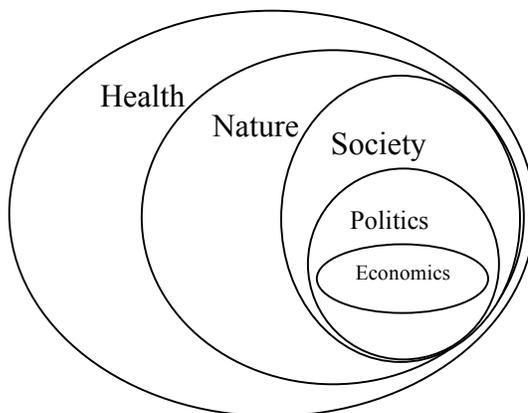
Figure 1. One possible depiction of an Ecohealth worldview

Identification and understanding of various stakeholder perspectives is necessary in order to consider how different ways of knowing about climate change resilience might be acted upon. For example, it is important to consider how different 'epistemic communities' [Chilvers, 2008] adopt 'types of knowledge' (e.g., scientific, indigenous, or local) [Gilligan et al., 2006]. Views about how natural and human worlds are situated (i.e., worldviews) influence how the realities (and implications) of climate change impacts are interpreted and therefore what policy initiatives are advanced.

It is therefore useful to define several commonly referred to 'types of knowledge'. Gilligan et al., [2006] differentiates between traditional, local, and scientific ways of knowing:

- *Traditional knowledge:* "a knowledge system based on tradition that is created, preserved and dispersed" [Gilligan et al., 2006, p. 3]. This type of knowledge tends to be passed down through generations and is influenced by many factors including

spirituality, relationships with natural/human communities, oral traditions and cultural beliefs. A key requirement of this epistemology is that *connection* within and between human-natural systems be acknowledged (e.g., *Inuit Qaujimajatuqangit*); however because this terminology can be confused with scientific knowledge – traditional knowledge will be referred to as *indigenous knowledge* in this paper.

- *Local knowledge:* "is possessed by a particular group of people [i.e., community members] and generated through *first hand experience* of one's surroundings" [Gilligan et al., 2006, p. 4].
- *Scientific knowledge:* "refers to the product of a Western or European approach to empirically studying, researching, and recording observations of phenomena" [Gilligan et al., 2006, p. 4].

So then, we come to the crux: why is indigenous knowledge important for enhancing ecological health? Kendrick [2003] explains the Dene concept of *inkonze* where humans can only ever know 'a little bit' about nature. These people who reside near the Athabasca River in the Canadian sub-arctic feel that our descriptions of the world around us will never be complete and are always prone to reinterpretation. In this sense, co-management becomes an adaptive process where human needs must be continually reassessed as changes occur in the surrounding natural system. Sustainability in the face of changing global environment is therefore one of perpetual learning. Indigenous communities are uniquely situated in that they have direct experience with and historical knowledge of their immediate environment [Gilligan et al., 2006]. As such, it is important to consider *how* indigenous knowledge is integrated into institutional communications aimed at enhancing community resilience.

1.2 Research Question and Objectives

This study, determining how indigenous knowledge is integrated into climate change policy-making about the Canadian Arctic, is informed by the above literature on an Ecohealth approach to adaptive co-management. The stakeholders, in this case, represent regional, territorial, and federal government institutions in Canada with explicit policies aimed at enhancing community resilience to climate change that incorporate indigenous knowledge. The core research question and main objectives of this proposed study follow.

Research question: How is community-level indigenous knowledge being integrated into climate change adaptation and resilience policy-making about the Canadian Arctic?

Objectives:
1. Create a vertical institutional *communications map* that: i) identifies regional, territorial, and national governing institutions (nodes) and channels of information (flows) focused on enhancing community adaptation/resilience in the Inuit Nunangat Region of the Canadian Arctic by incorporating indigenous knowledge; and ii) offer a preliminary assessment of the role indigenous, local, and scientific knowledge types play in these communications.
2. Develop a vertical institutional *communications model* in collaboration with key government, research, and community stakeholders using narrative policy analysis of the 'policy stories' told about how indigenous knowledge has been or is currently being integrated into climate change policy-making.

2. DISCUSSION

2.1 Proposed Methods

I propose two phases of research for this study. The aim of the first phase is to produce, in

collaboration with climate change policy stakeholders, an institutional communications map identifying key governmental agencies concerned with incorporating indigenous knowledge into Arctic climate change policy in Canada. The aim of the second phase is to develop a communications model explaining how indigenous knowledge is integrated into climate change policy communications by using narrative policy analysis to identify a larger story or meta-narrative that incorporates the varied viewpoints of government, academic, nongovernmental, and community stakeholders.

2.1.1 Institutional Analysis: Mapping Communication

In the area of risk communication, messages about potential threats are sent to various receivers (e.g., emergency managers, risk analysts, the news media) by way of 'risk signals'. The social amplification of risk framework (SARF) [Kasperson et al., 1996] is one of the models used to understand this process of communicating risk signals. In Figure 2, a simplification of the SARF, any policy is based on information that can be transmitted to one or more receiver(s).

A key facet of this framework is that value is either added or subtracted from these messages as signals are received (i.e., amplified or attenuated). The value type depends on the content of the message about the policy so that not all information communicated will be about, for example, risk. Signals sent to policy-makers might also contain information

Figure 2. The components of communication

about the relative *priority* of particular policy agendas. Both the priority of various policy issues as well as the integration (use) of indigenous knowledge can be mapped according to 'signal priority' as part of institutional communications about climate change policy.
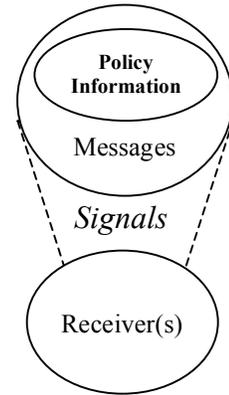
I propose the following participatory approach to creating a vertical institutional communications map for each Inuit Nunangat Region in the Canadian Arctic (i.e., four maps). Please note that preliminary networking with academic, government, and nongovernmental stakeholders has provided the starting point for this procedure.

  1. Identify key national institutions (e.g., Health Canada, Indian and Northern Affairs Canada, Inuit Tapiriit Kanatami) with directives that aim to enhance climate change resilience in the Canadian Arctic and/or integrate indigenous knowledge into climate change policy-making.

  2. With the assistance of key contacts from these national institutions, identify regional institutions and stakeholders concerned with climate change adaptation policies that incorporate indigenous knowledge (e.g., Nunavut Research Institute or Sachs Harbour Community Corporation).

  3. Pending ethics approval, invite regional stakeholders to collaborate on a *pilot mapping exercise*. Visits will be made this summer to discuss/begin the territorial to national mapping in Ottawa (June/July) and regional to territorial mapping in one of the four Inuit Nunangat regions (July/August).

  4. The mapping will be an iterative, participatory process consisting of a short questionnaire asking stakeholders to rate: the *priority* (no priority = 0; low priority = 1; medium priority = 2; high priority = 3) they ascribe to various issues including food security, climate change adaptation, contaminant exposure, northern development, and any other issue of concern to them; and their *use* of indigenous, local and scientific knowledge (no use = 0; low use = 1; medium use = 2; high use = 3) in communications about each of

the above issues. As well, participants will be asked to suggest other institutional stakeholders who might have an interest in climate change adaptation policy-making in their region at any level of government (regional to national). Once all relevant stakeholders are identified, the map will be returned to each participant for validation.

5. Apply the final, validated procedure from the pilot-mapping project to *three case studies* in each of the other Inuit Nunangat Regions.

6. Prepare four validated vertical climate change adaptation communications maps highlighting the priority of various issues in the Canadian Arctic and the usefulness ascribed to each knowledge type for narrative policy analysis based on in-depth interviews with stakeholders from the institutions identified through the mapping procedure.

2.1.2 Narrative Policy Analysis: Modelling Communication

Narrative policy analysis will be used to understand how various knowledge types are, or could better be integrated, maximizing the ability of communities to adapt to climate change impacts. Narrative policy analysis is useful for understanding why various stakeholders might want different types of policies to be enacted and to tell a larger story or meta-narrative which addresses a range of stakeholder concerns [Roe, 1994; Bridgman et al., 2002]. Hirsch [2010] adapted Roe's [1994] narrative policy analysis to include the following three steps: 1. identify the main story/narrative developed by each opposing coalition (i.e., those with a stake in the issue at hand); 2. consider any alternative stories, alterations to the current stories, or potential counter-narratives (i.e., opposing viewpoints); and 3. consider how any of the alternatives arrived at in step two may be coalesced into a larger meta-narrative that combines the opposing narratives from step one.

I therefore propose the following procedure in order to model institutional communications about how to integrate indigenous knowledge into policy-making about the Canadian Arctic. In-depth interviews will focus on how to best integrate multiple types of knowledge into climate change adaptation policy. Questions will focus on, for example, how to define indigenous, local and scientific knowledge, similarities and differences between knowledge types, and perceived barriers to or opportunities for knowledge translation in the policy-making process. Thus, there is potentially much to learn from a narrative policy analysis approach [Roe, 1994] that considers how stakeholders prioritize and use different types of knowledge [Young et al., 2008].

3. CONCLUSIONS

The main goal of this study is to determine how community-level indigenous knowledge is being integrated into climate change adaptation and resilience policy-making about the Canadian Arctic. Two phases of research are proposed including preliminary mapping to describe key institutional communications between various stakeholders followed by in-depth narrative policy analysis [Roe, 1994] of these communications in order to identify opposing policy arguments, underlying issues, and suggestions about how communications might be improved within a particular policy context [Hirsch, 2010]. Indigenous knowledge adds an important component to climate change policy-making because it recognizes that both human and natural systems are complex and ever changing requiring continual re-evaluation of our needs and priorities [Kendrick, 2003]. This is especially the case in the Canadian Arctic where policy-makers [Health Canada, 2010] and researchers [Berkes et al., 2001] have been interested in working with communities in order to gather evidence about local level adaptive capacity.

This two-phase study has the potential to advance a larger interdisciplinary project with substantial theoretical, methodological and ethical contributions. This research contributes

theoretically to an Ecohealth approach by exploring how the integration of various types of knowledge (i.e., indigenous, local, and scientific) facilitates or constrains communications about environment and health policies [Kendrick, 2003]. Methodologically, this study uses a two-step approach to enhance rigour by first *scanning* for organizational structures and stakeholders by creating an institutional map and then by *delving* into the processes of information exchange and valuation by modelling communication between these stakeholders. Further, there is an ethical imperative to ensure that communities benefit from research done by communicating traditional knowledge in a manner that remains true to the goals and interests of participants. Synthesis of these 'policy stories' will uncover opportunities and obstacles for communicating about indigenous knowledge and will therefore facilitate policies aimed at enhancing community resilience. Overall, this project will help link research done, policies currently in place, and the actual practices of communities all aimed at promoting ecological resilience in the face of a changing environment.

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