3A.2 NIAGARA CLIMATE CHANGE PROJECT- A COLLABORATIVE PARTICIPATORY APPROACH TO CLIMATE CHANGE ADAPTATION

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Introduction

The local, national and international dialogue on climate change continues to be dominated by strategies to mitigate anthropogenic causes and effects of carbon dioxide release while communities throughout the world begin to experience the impacts of climate change. The Fourth Assessment Report of the International Panel on Climate Change explains ".. even the most stringent mitigation efforts cannot avoid further impacts of climate change in the next few decades, which makes adaptation essential, particularly in addressing near-term impacts"(IPCC 2007, p.20).
Environment Canada acknowledges and supports a stronger focus on adaptation to ensure Canadians are informed and prepared to adapt to the many climate change impacts as expressed in their *Adaptation and Impacts Science Plan* (Environment Canada 2009) and in their future strategic direction to 'reduce risks from a changing climate, and build resilience in Canadian communities and key economic sectors' (Environment Canada 2007).

As governments and communities turn their attention to adaptation we must recognize the capacity to adapt to the impacts of climate change is not uniform for all individuals, communities and societies. Some have a greater capacity to adapt while other less so.
Learning, recognized as central to effective adaptation, and learning processes that emphasize collaboration and participation in response to change are key to adaptation (Armitage and Plummer 2010) can increase the adaptive capacity of a community. The concept of social learning is particularly instructive in this context as it involves ' the iterative action, reflection and deliberation of individuals and groups engaged in the sharing of experiences and ideas to collaboratively resolve complex challenges' (Keen et al. 2005).

With the support of Environment Canada and Brock University, the Niagara Climate Change Project aims to facilitate and support the development of a collaborative network of existing stakeholders in Niagara to collectively engage in planning and actions for adaptation to climate change, with the ultimate goal of increasing adaptive capacity and enhancing the governance network for climate change in Niagara. The Niagara region covers 1,852km^2 and is located in southern Ontario between Lake Ontario and Lake Erie. Niagara is comprised of 12 municipalities and one regional municipality servicing a population of approximately 430,000 (Statistics Canada 2006). Niagara is home to Niagara Falls, Canada's largest wine producing region, and has a large agricultural sector all made possible by the moderating effects of both lakes on the climate. With a heavy reliance on this unique climate, Niagara must adapt to the changing climate if it is to be resilient in the future.

This paper describes the design of the Niagara climate change project and seeks to extend our understanding of how communities may collaboratively respond to climate change adaptation. The paper is organized into three main parts; the first describes the project design and documents the initial participatory phase, the second outlines the anticipated outcomes, and reflective thoughts based on the first year of the project are offered in the final section.

Project Design and Initial Steps

Initial preparation for the project began in 2009 with a detailed proposal to Environment Canada setting forth the key components of a successful process: developing background information and knowledge, using the Rapid Assessment Impacts of Climate Change (RAICC) and the Canadian Climate Change Scenarios Network (CCCSN) by the Adaptation Impacts Research Section of Environment Canada to facilitate adaptation while engaging actors in a participatory and learning process. Developing background information and knowledge commenced in 2009 and consisted of several components:

1. academic white paper explaining the key theoretical concepts this applied project is based on

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2. development of a socio-economic profile of the Niagara region
3. assessment of atmospheric hazards in the Region
4. Social Ecological Inventory (SEI) of boundaries and actors for the Niagara region
5. survey of local governments to understand existing efforts for adaptation, mitigation and resilience.

Through this diverse and extensive background gathering a clear profile of Niagara was constructed. The socio economic profile and the survey of local governments for existing efforts were completed by December 2009.
The SEI was completed in October 2010, with 38 key actors identified from 33 organizations spanning 9 sectors, consisting of regional and municipal government -8, education-4, media-2, emergency management-4, ecological management -5, healthcare-1, business-2, NGO's - 10 and agriculture-2.
The SEI provided an overview of current strategies, collaborations and common challenges for the Niagara area.

Participatory phase

Having identified the key actors in Niagara and completed much of the background research, the project moved into a participatory phase.
The process began with an introductory meeting with the identified 38 key actors meeting with the research team and developing a deeper understanding of the project, including its design, goals and ethics. Participants were not given an opportunity to interact with each other during this session as the research team wanted to gather baseline data for network analysis and social learning at a subsequent workshop.
AS determined from the SEI, participants identified a lack of local climatic impact projections as a major challenge to adaptation. In response to this need the first workshop, organized a month later, used the RAICC tool giving participants an understanding of the potential impacts climate change would have for Niagara. The latest local climatic data, from Environment Canada, was complied and analyzed by Dr Adam Fenech who created the RAICC tool, showing past, present and potential future trends. Dr Fenech was then able to relate this information to concerns from various sectors such as how an increase in winter and summer temperature created an environment for Lyme tick survival allowing the tick to spread through out Niagara.
Baseline data for network analysis and social learning was collected at the beginning of this workshop with all participants completing a survey adapted from four different surveys (Leiserowitz et al. 2010, Dunlap et al. 2000, Stedman 2004, NSCCN 2009) to assess present knowledge and understanding of climate change, collaborations between organizations for a network analysis. Participants were also asked to complete a mind map as a graphic method for measuring social learning based on (Haug et al. 2010)
These same instruments will be given to participants again in 12 months to assess for increased knowledge, collaboration and evidence of social learning.

At the end of this workshop participants requested another meeting to gain an understanding of what activities were already occurring in Niagara and elsewhere. During this second meeting all participants spoke about there past, present and future efforts related to environmental and climate change. Areas for collaboration on new and existing strategies were discovered as participants began to understand the efforts occurring in other sectors.
Jennifer Penney, Director of Research at the Clean Air Partnership, in Toronto came as a guest speaker, giving insight into the motivations, accomplishments and challenges Toronto had over the past decade.
This session finished with the participants beginning the discussion on the merits of continuing to meet and what potential effects they could have as a group on the future resilience of Niagara as climatic and environmental changes occurred. This discussion continued for the following four months as facilitated through formal meetings.
The research team remained supportive through this time offering guidance as requested but at no stage did they take on a leadership role. If this group of key stakeholders were to be self sustaining they must find their own leadership and define their own processes and goals so they could be self-reliant as the group formed and moved forward allowing the research team to become a background academic support ensuring the latest science was available as required.
Within seven months of the first workshop a core group of 18 participants from 8 sectors formed the Niagara Climate Change Network (NCCN). This consisted of: regional and municipal government- 4, healthcare - 1, education -2, media -1, business -1, agriculture -1, ecological management -5, NGO's - 3

Anticipated Applied Outcomes

The decision by the key actors to form the NCCN occurred over a four-month period during this time several action items were agreed to and worked on by the group. These items were:

- creating a Niagara climate change charter that group members, municipalities, organizations and individuals could publicly sign on to but that required no initial action
- a white paper offering a comprehensive reflection of present adaptive strategies, areas of opportunities and vulnerabilities in Niagara

- developing a community climate action plan for both mitigation and adaptation strategies specific to the Niagara region.

In part because of the present lack of municipal climate change policies it is our belief that over time these action items will significantly influence local and regional policy and governance.
The inception of this group was facilitated and supported by Brock University and Environment Canada. As the network establishes itself these organizations will move to more knowledge support roles, offering guidance and expertise as various questions arise.
We hope this documented group process will help to inform other communities both nationally and internationally as they look for ways to address climate change adaptation within the framework of a participatory collaborative approach.
The process and data collected will also add to the academic literature on social learning and adaptive collaborative management.

Reflections

The Niagara project is an iterative and reflective process. We have attempted to bring key environmental leaders together and prompt them to begin working on regional climate change adaptation. While this project has given Niagara a 'jump-start' in getting key actors to the table keeping them at the table with no defined leadership or immediate perceived threat has been challenging.
Brock University and Environment Canada have been ideal institutions to begin this process due to their political neutrality in the Niagara region. Through the formation of the NCCN several members who had previously collaborated have struggled to overcome past conflicts and have stated "because Brock University is facilitating the process and has no bias they will remain at the table and part of the NCCN". This puts a great of pressure on the research team as we attempt to move from a facilitation to a support role.
At the same times the Niagara project brings leaders from various sectors together who have no previous interactions or collaborations, these sectors have been weary of each other requiring time to develop relationships and trust.
Unfortunately while these past histories and new relationship dynamics play out the participatory nature of this project also creates a challenges in terms of leadership.

Brock University has declined to take the leadership role and with no other neutral and well-respected organization volunteering to take that position the formation of the network has been delayed and lead to some stakeholders to leaving the process. A lack of leadership in Niagara was a commonly cited challenge identified in the SEI, a situation that has continued in this process.
In reflection, this network would have formed earlier if a neutral leader had begun to lead at the beginning of the process. With Brock being the perceived leader at the beginning NCCN members struggle to let that role pass to others. Unfortunately with no imminent perceived threat stakeholders continue to be relatively passive with leadership.

When this process began Environment Canada committed to fund this project through a multi year agreement with Brock University, however due to restructuring in the Adaptation and Impacts Research Section of Environment Canada, that funding is no longer available requiring the network to find sustainable funding. For 2011-2012 the network has been able to access adequate funding signaling that these stakeholders are very serious about the present action items. The source of future funding is not yet certain, with the NCCN deciding to assess funding options as new action are decided on.

The NCCN is a voluntary commitment some stakeholders have more time and resources to support than others while some receive little or no recognition from their organization, with their efforts sometimes perceived as a waste of resources. This situation has resulted in the same members volunteering to sit on the various action item committees and having more impact on the participatory process and causing concern to other members that the process is becoming biased to the needs of a few and less transparent.
While the research team has previously offered to speak to organizational boards it is now up to the NCCN to define the process to ensure transparency continue.

Conclusion

The Niagara Climate Change project is a collaborative participatory approach to climate change adaptation based on the theory of social learning. While the project participants have only been together for seven months, it is expected the newly formed network will have a significant impact on local policy and governance thereby strengthening Niagara's resilience to future impacts of climatic and environmental change.

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