How do Inuit fishers experience and respond to climate change?

Empirical evidence from the Pangnirtung community in Nunavut, Canada

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Arctic coastal fishery systems are undergoing rapid change (Arctic Council 2016). Can Inuit fishers adapt to such change? This study is based on the Pangnirtung Inuit fisher community located in coastal Baffin Island, Nunavut, Canada. This fishery relies primarily on two fish species: Arctic char (*Salvelinus alpinus*) and Turbot/Halibut (*Reinhardtius hippoglossoides*). This paper examines the ways in which Inuit fishers in the Arctic experience and respond to change, focusing in particular on climate change.

Climate change implications increase the uncertainties and complexities in human-environment systems. Though resilient indigenous fisheries systems exist, it seems that they have not been studied from the systems perspective. This study will bridge this research gap by adding theoretical value to the research areas of resilience, vulnerability, and adaptation. It will also be of practical significance, as it relates to the governance of indigenous fisheries in the face of environment and climate change.

Photo 1: Community boat yard.

Photo 2: Catching Arctic Char using a gill net.

Objectives

- To understand how Inuit fishers experience change, including climate change.
- To examine how Inuit fishers respond to and face such changes.

Methodology

A qualitative research study was conducted in the Pangnirtung and Cumberland Sound coastal area in Baffin Island. The research strategy adopted was the case study approach.

Primary data were collected through:
Participant observation (May-August 2017);
Semi-directive interviews (n_1=51 fishers);
Focus group discussions (n_2=3);
Key informant interviews (n_3=6); and
Spot interviews (n_4= 23 locals).

Photo 3: While interviewing.

Photo 4: Madeleine Qumuatuq posted this photo comment on community social media page. This is evidence of how researchers cultural identity shapes the research positionality.

The sample of fishers was selected using the snowball sampling technique. The social-ecological systems approach (Berkes et al. 2003), along with the community-based participatory research approach (Magee 2013), was used to capture the interconnected nature of climate change impacts as well as to ensure community engagement to shape knowledge production. Data analysis was carry out using primarily a 'manifest' and 'latent' content analysis to develop themes, patterns, and variables.

Fig. 1: Study area: Pangnirtung Inuit fisher community located in Baffin Island, Nunavut, Canada.

Results

Sample profile

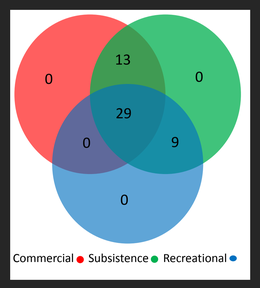

Fig. 2: Venn diagram for mixed fisheries.

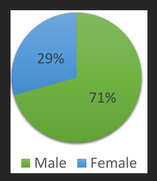

Fig. 3: Gender.

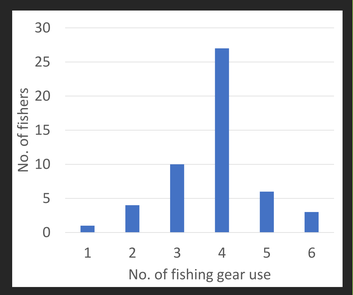

Fig. 4: Fishing gear diversity.

How do Inuit fishers experience change?

Inuit fishers experience change in many ways and the process is integrated into their indigenous way of life. Changes related to sea ice conditions (74%), Inuit people (23%), Arctic Char and Turbot (19%), weather conditions (17%), fish selling prices (8%), landscape (8%), and the emergence of Capelin (*Mallotus villosus)* (5%) are among the most recorded changes.

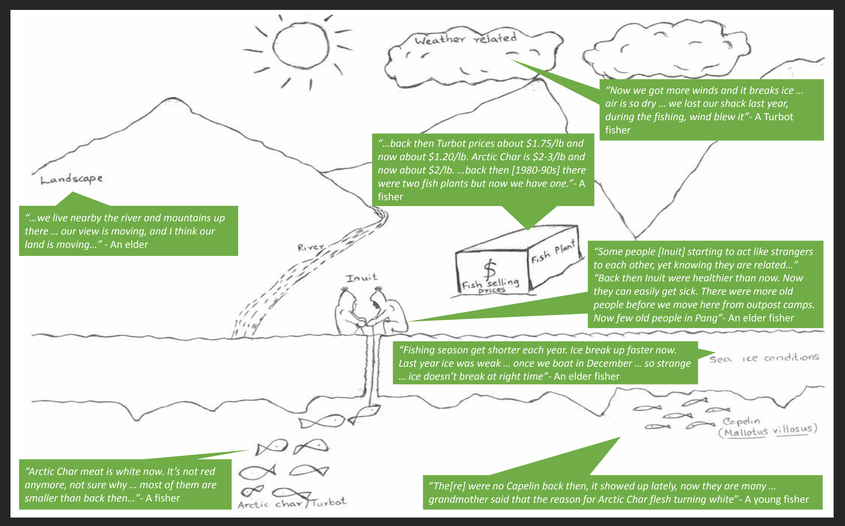

Fig. 5: Inuit fishers experience climate change impacts in an integrated way.

How do the Inuit respond to and face change?

Inuit fishers respond to change both individually and collectively. We identified five methods for responding to change.

Sharing and collaboration: Almost all (100%) fishers share their catch with relatives and elders, especially those who are unable to fish and hunt. Community members help each other mainly by communicating via local radio and internet-based social media.

"Fish plant giving me weather information and I inform them [fishers] through radio. If you [fishers] caught more fish, you go to radio and ask people to pick up or give it to elders"- Local radio host

Use of technology: More than 84% of active fishers have adopted recent technology such as Global Positioning Systems (GPSs), Very High Frequency (VHF) radios, and advanced rifles for fishing/hunting activities.

"Our elders told not to go when it rainy or foggy, but we go out now whenever with GPS"- A young fisher

'Place': Place-based attitudes, cultural identity, and values help the Inuit live with change. More than 74% of fishers said that, no matter how much the climate changes, they don't want to move away from Pangnirtung.

"Springtime is warmer now. We used to keep long lines, usually about five hours. Now we get more Greenland sharks when we keep lines under ice for such a long time. Now I keep about two hours, but less Turbot for me. I am ok with what we have now..."- A Turbot fisher

"Kids..., we think children is owned by everyone in the community. We raise any kid to give them a better life"- A single mother

Institutions: Inuit-owned fishery institutions such as Pang fisheries and Baffin Fisheries create employment and commercial fishing opportunities for local fishers. More than 82% of fishers are involved in commercial fishing.

"Pang fisheries give long lines, ropes, and hooks and you can pay back later as money or fish..."- A fisher

Knowledge diversity: The Inuit use various kinds of knowledge to face change: local knowledge about fishing, traditional knowledge from elders, and the co-produced knowledge of fishers.

"Muddy areas are the good spot for Turbot. But for Arctic Char every area is good"- A fisher
"We use Caribou skin as a bait or to trick fish ... learned that from elders..."- A young fisher

Discussion

Three lessons were learned from the ways in which Inuit fishers experience change: (1) much of the changes relate to climate change; (2) climate change has mixed implications for the Inuit fisheries' way of life; and (3) the Inuit people themselves are changing over the time with the social-ecological systems change.

Photo 5: Changing landscape and river.

Photo 6: Fish plant, Pang Fisheries.

Five major thematic areas that shape the adaptations of Inuit fishers are: sharing and collaboration, the use of technology, place-based attitudes and cultural identity, the Inuits' own institutions, and the use of diverse knowledge systems. The combination of these five aspects will reduce systems' vulnerability and help build the resilience of Inuit fisheries systems by increasing adaptive capacity.

Photo 7: VHF radios and advanced rifles.

Photo 8: Country food sharing event.

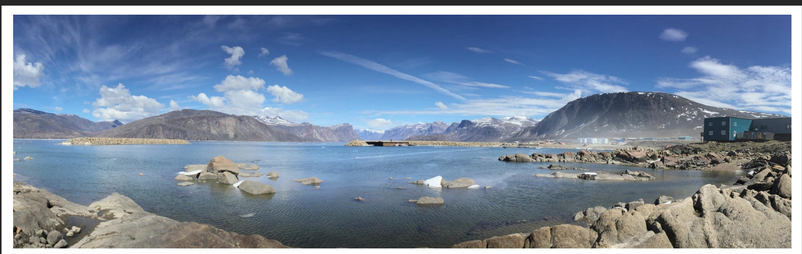

Photo 9: *"...this [Pangnirtung] is where I born ... I belong here [Pangnirtung]..."*- A young fisher

Conclusion

Inuit social-ecological systems are undergoing rapid change, primary among which is climate change. Adaptation to climate change is the key to facing such systemic changes effectively. Continuous learning and adaptation is the necessary pathway to sustainability. An understanding of how Inuit fishers experience and respond to change is essential to better understand adaptations to change, including climate change.

Future directions

This study is based on a comparative analysis between indigenous fishers in the Canadian Arctic (Inuit) and in Eastern Sri Lanka (Coastal Vedda). The findings of this Arctic study will allow for cross-scale comparisons and the exchange of adaptation lessons among regions.

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NSTP PFSN Northern Scientific Training Program / Programme de formation scientifique dans le Nord

CIHR IRSC Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Photo/drawing credit: Eranga Galappaththi

SSHRC CRSH Social Sciences and Humanities Research Council of Canada / Conseil de recherches en sciences humaines du Canada