Local and Traditional Knowledge Indicators for Tracking Socio-Ecological Changes in Inuvialuit Fishing Livelihoods

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INTRODUCTION

The Mackenzie Delta is an important freshwater system that is vulnerable to multiple stressors, including:

- Climate change impacts in the Arctic
- Resource development activities (oil & natural gas)
- Upstream-downstream linkages

These pressures can affect traditional livelihoods[1], including fishing since the Inuvialuit rely on the land for their subsistence but also for their wellbeing[2].

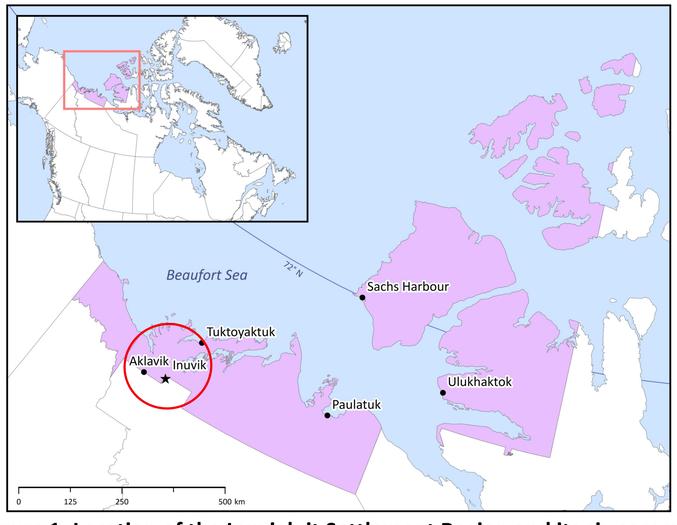

Figure 1: Location of the Inuvialuit Settlement Region and its six communities

This research seeks to effectively mobilize Local and Traditional Knowledge (LTK) to understand the significance of social and ecological changes in Inuvialuit fisheries in the Mackenzie Delta.

Key research questions:

- What are the social and ecological changes in freshwater systems that are currently observed by the fishers in the ISR?
- What are the indicators and methods used by fishers to identify and understand these changes?
- How do/are these changes affect/expected to affect fishing livelihoods and to a greater extent Indigenous communities in the ISR?

CONCEPTUAL FRAMEWORK

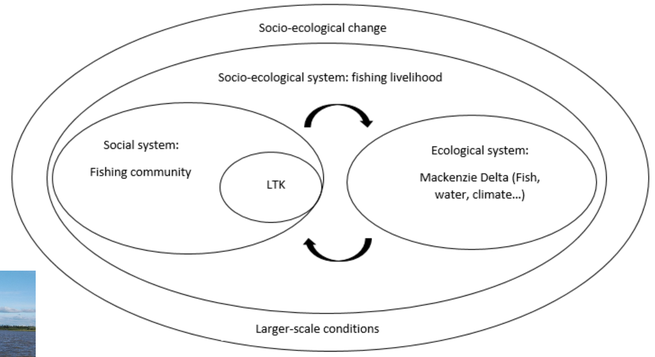

Figure 2: Conceptual Framework[3] [4]

METHODOLOGY

Following Indigenous research methodologies, we conducted collaborative, primarily qualitative research that involved a high level of participation[2]. Since LTK is rooted in oral traditions, ethnographic methods provided great flexibility[5] in undertaking:

- 28 semi-structured interviews with mapping and harvest survey components
- Two winter fish camps: one each in Inuvik and Aklavik

INDICATORS OF CHANGE

Table 1: LTK indicators of change in fisheries

Theme	Indicator	Observation	Livelihoods impacts
Fish quality	Flesh texture	Softer flesh, particularly during the summertime	Preference for fish from the Ocean during the summertime
	Flesh color	Grey flesh in whitefish	Not edible
	Fish appearance	Increase of scars and lumps	Not edible
	Parasites	More fish with higher parasite loads	Not edible
	Livers	Discoloured livers in burbot	Not edible
Fish population	Chum Salmon	New observations of Chum Salmon in the Delta	Additional species for consumption
	Whitefish	Fewer whitefish	Change of fishing practices or locations
	Jackfish	Growing population of jackfish	Not part of the diet; released when caught

Theme	Indicator	Observations	Livelihood impacts
Water levels	Water levels	Some areas have lower water levels	Reduced travel patterns and fishing access
	Desiccation process	Some lakes and creeks have dried up	Loss of fishing places
	Sandbars	Increased number of sandbars	Reduced travel patterns and fishing access
Water quality	Turbidity	Dirtier waters	Concerns regarding water
Water flow	Water flow	New places with stagnant water, bad taste, different colour	Concerns regarding water and fish
Water temperature	Water temperature	Warmer waters, particularly during the summertime	Few participants think that it could affect fish flesh
Ice	Ice thickness	Reduced ice thickness in certain areas	Travel safety
	Freeze-up/break-up	Longer freeze-up/break-up periods & changes in their timing (e.g. earlier break-up)	Access to fishing and hunting places: dangerous and unpredictable but more boating opportunities (-/+)

Table 2: LTK indicators of hydrological change

CONCLUSION

LTK holders are key actors[6] for understanding, tracking and monitoring socio-ecological changes in the Mackenzie Delta. Research results highlight the importance of fishing livelihoods in the Mackenzie Delta and the significance of environmental changes for Inuvialuit. These changes impact mental and cultural well-being, as well as food security.

Major concerns were raised regarding water quality, the health of fish, and the safety of fish for consumption. As such, there is a need to further explore the interconnection between fishing livelihoods, water security and food security.

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