



Actor-issue network analysis of an indigenous food system on St. Paul's Island, Alaska

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In collaboration with the Aleut Community of St. Paul Island

Introduction

Indigenous arctic communities, such as the Aleut community of St. Paul's Island, Alaska, are facing many interlinked challenges to the resilience and sustainability of their food systems.¹ Climate change, increasing food prices, and declining subsistence species all pose a threat to the diverse mixed economies that they rely on, while knowledge loss and outmigration diminish local capacity. Understanding the interconnections between local actors and these issues is key to developing resilient food systems that maintain both food security and traditional Indigenous practices.



Research aims

To identify priority issues and potential governance gaps in the food system network of the Aleut community of St. Paul's Island, Alaska.

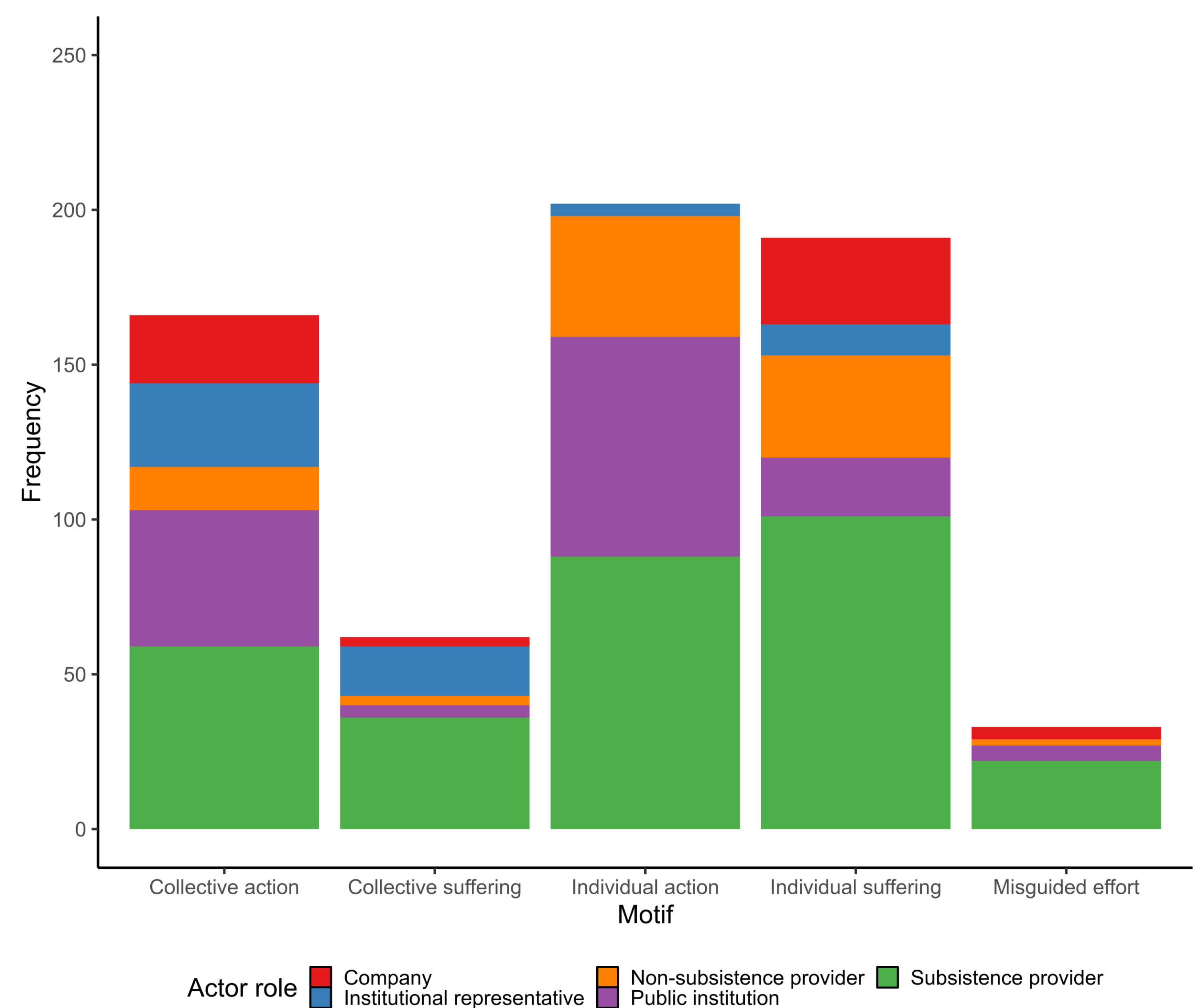
Methods

- Identified **motifs** (patterns of nodes – actors or issues – and links between them)² in the food system network constructed through interviews with local stakeholders.
- Calculated the frequency with which the motifs occurred, and the actors and issues involved.
- Identified possible **governance gaps**, which community members could then plan action steps to address (see 'Future work' below).

Network structure

- 126 issues, 91 actors
- Actor categories: Company, institutional representative, non-subsistence provider (e.g. community member), public institution, subsistence provider
- Actor-issue link categories: influence (actor→issue), impact (issue→actor)
- Actor-actor link categories: communication, subsistence activity, food purchase, working together, food shipping, resource exchange, food sharing, food donations

Motif	Issues most present (no. of motifs)
<p>Collective action</p>	Wildlife decline (44) Food prices (30) Transmission of subsistence knowledge (16) Trawling (15) Food scarcity (10) / Food shortages (10)
<p>Individual action</p>	Food prices (711) Wildlife decline (281) Trawling (261) Transmission of subsistence knowledge (174) Climate change (166)
<p>Inclusive governance</p>	No motifs of this type identified in the network
<p>Collective suffering</p>	Weather (40) Physical ability (12) Plane not coming in (10) Climate change (9) Barge not coming in (7) / Logistics (7)
<p>Individual suffering</p>	Shipping costs (15) Weather (13) Food prices (12) Barge not coming in (11) Plane not coming in (10)
<p>Misguided effort</p>	Fresh produce: Quality (16) Trawling (12) Bycatch (10) Food scarcity (7) Pollution (4)



Actor types within each issue

The frequency of each type of actor within the different motifs (see illustrations on the left), across all issues (actors could be counted multiple times). No instances of inclusive governance motifs were identified in the network.

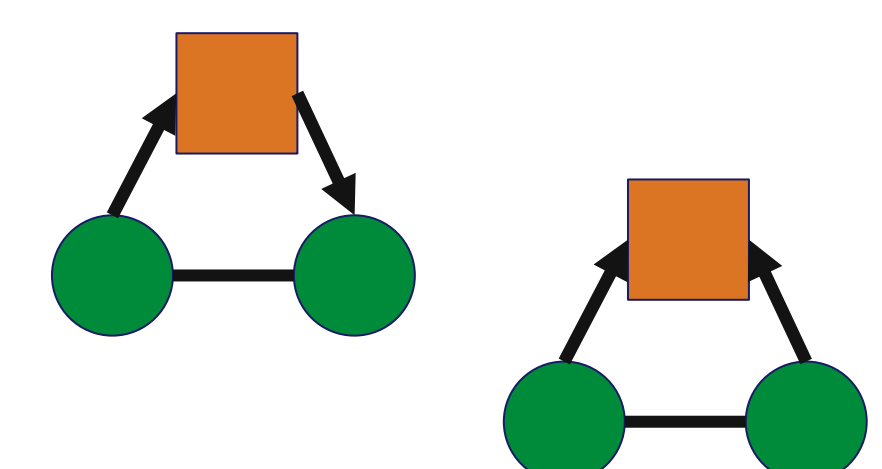
Key findings

- Clusters of issues with similar addressability:** similar issues were frequently present in *collective action* and *individual action* motifs, and *collective suffering* and *individual suffering* motifs, but these were mostly distinct from each other
- Several key issues** have high impact and are interlinked, but are also present in *collective action* and *individual action* motifs, so there is potential for them to be addressed
- Highly connected network:** few issues present in *misguided effort* motifs – there are also no instances of *inclusive governance* motifs, so connecting those with influence and those being impacted within the misguided effort motifs could be a way to address these issues
- Almost all actor types present in each motif**, with institutional representatives most present in *collective action* and *collective suffering* motifs, due to their high level of connectivity (Zimmermann *et al.*, in press)

Future work



Stakeholder workshops



Identifying recurring patterns of issue types

References:

- Zimmermann *et al.* (2023) <https://doi.org/10.1007/s11625-022-01280-2>
- Bergsten *et al.* (2019) <https://doi.org/10.1016/j.envsci.2018.10.007>

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