Project information

Keywords
Global change, extractive industries, tourism, socio-ecological dynamics, accessibility, land use, wildlife, reindeer/caribou, ecosystem services

Project title
The impact of extractive industries and tourism on socio-ecological dynamics in the Arctic (RConnected)

Year
2016-2018

Project leader
Vera Hausner

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
Circumpolar Arctic (definition according to Arctic Council)

Participants

Per Fauchald, Norwegian Institute for Nature Research (NINA),

Dorothee Ehrich; UiT-Arctic University of Norway

Else Grete Broderstad; Center for Sami Studies, UiT.

Funded by CONNECT

Jennifer Irene Schmidt; University of Alaska, Anchorage;

Konstantin Klokov, SPSU

Flagship
MIKON

Funding Source

Research support

Summary of Results

Summary (milestones 2016, task 1-7)

The rapid melting of sea-ice in the Arctic Ocean could increase the accessibility and change the prospects of resource development and tourism in the most sparsely settled areas in North America and Russia. In RConnected we are contrasting the socio-ecological dynamics in the more accessible and ice-free areas in the northern periphery of Europe with the more remote areas in Arctic Russia, Alaska and Canada (data from CONNECT). In the first year, our main tasks have been to develop models and collect data that will be analyzed next year. We have downloaded socioeconomic data and are currently working to separate local-and tourist Flickr photos and check the reliability of using these photos for monitoring tourism activities for large scales in the Arctic. We are also validating our accessibility index by collecting data on the minimum cost and travelling time to access communities in the Arctic, and the costs of bringing 500 kg of goods. This work will finish by the end of the year. We have made a design for analyzing impacts of mining in North America and we will submit a manuscript on the relationships between local communities and extractive industries in Russia by the end of the year. We have also used a quasi-experimental design to analyze causal effect of land use change around communities in the Arctic, where the regional effects and access to wage income is among the main causes of change. Ms will be submitted by the end of the year. Finally, we have

finished the analyzes of fish-and wildlife resources for the western Arctic resulting in two ms that are under revision.

Highlights

- Topic modelling of web of science records (N=20 880) shows that only a small percentage (12%) of the peer-reviewed environmental research in the Arctic is addressing the sustainability challenges by linking environmental changes to the three P's (people, policy or politics). Among those 12% there are large gaps between science focusing on large scale drivers of environmental change and local case studies of socio-ecological dynamics (Hausner et al., ms).

- In RConnected we aim to analyze how broad scale transitions influence local socio-ecological dynamics. We have developed a model for socio-ecological dynamics in the western Arctic (Greenland, Canada, Alaska), which we tested by synthesizing data. We found that fish- and wildlife resources have primarily been influenced by i) exogenous drivers such as climate- and previous industrial overharvest and ii) commercialization of fish and wildlife resources that have provided cash income and incentives to increase harvest (Fauchald et al, accepted).

- Large-scale analyzes of caribou herds in North America show that the recent Arctic greening from warming has promoted declines in caribou populations. Thus, a greener Arctic seem to have detrimental effect on caribou populations. This is possibly due to a climate induced vegetation shift to increased cover of non-edible shrubs on the Arctic tundra (Fauchald et al, in rev).

- Local land use in the Arctic Russia and North-America is determined by regional differences and access to cash income (Ehrich et al., ms).

- One of the assumptions in the local resource curse theory predicts that extractive industries could erode relationships between locals and public institutions. We found that in resource rich regions in Arctic Russia, the resource curse could be counteracted by the social benefits provided by companies or the government (Klokov et al, ms).

Master and PhD-students involved in the project

A PhD student from Utah State University is currently linked to the project, working with tourism and socioecological dynamics.

For the Management

The results of relevance from this first year is mainly from the indigenous and other remote local communities in Greenland, North America and Russia.

In the western Arctic (Greenland, Canada, Alaska) food security, naturally declining populations and the permit to selling fish-and wildlife resources are among the most important governance challenges. In the western Arctic we find that harvest has declined the last 50 years. One of the reasons for the decline is increased wage labor and importation of food. The harvest impact is generally low, but in several cases governance challenges aroused because of declining resources due to e.g., climate change or because of commercialization of the fish-and wildlife resources. Our study show how SES transitions fundamentally alter the governance challenges. In particular, Arctic warming is an intensifying exogenous driver that is threatening many important Arctic wildlife resources inflicting increased appropriation challenges to the governance of local harvest.

Extractive industries are relevant for several indigenous and remote communities in Russia. The academic literature is discussing whether the industry is a curse or a blessing for the local host communities. The resource curse build on two predictions i) the extractive industry could impact traditional livelihoods, reduce the welfare, and the economic productivity of local communities on the long run, and ii) resource governance may lose legitimacy due to the higher differences in welfare that industrial development may cause, where some elites will reap the benefits of industrial development while others are left with the costs. This will in turn erode trust in the government in charge. We explored this latter assumption by comparing 14 different communities, and found that investments in community development by either the companies or the government (primarily local and regional) could in some cases counteract the resource curse and maintain local trust in government.

Published Results/Planned Publications

Fauchald, F., Schmidt, J., Clark, D., and Hausner, V.H. 2016. Transitions of socioecological subsistence systems in the Arctic. International Journal of the Commons, *accepted*.

Fauchald, P., Park, T., Tømmervik, H., Myneni, R. Hausner, V.H. Arctic greening from warming promotes declines in caribou populations, Science Advances, *in revision*

Dorothee Ehrich, Alma Thuestad, Hans Tømmervik, Per Fauchald, and Vera Hausner. Tracking local land use associated with socio-economic development in six arctic regions, ms. To be submitted before 31st December.

Hausner, V.H. & Rebich ,S. .2016. Identifying research gaps and needs in Arctic ecosystem services research by modelling of large textual data sets, Conference Abstract, European Ecosystem Service

Conferene, Antwerp 19.-22 September (expect to submit ms before end of December)

Klokov, K., Ehrich, D.E. & Haunser, V.H. The local resource curse and trust in resource governance in the Russian Arctic

Ehrich, Dorothee; Thuestad, Alma Elizabeth; Tømmervik, Hans; Fauchald, Per; Hausner, Vera Helene. A circumpolar comparison of visible land use associated with socioeconomic conditions in six Arctic regions. Arctic Frontiers 2016-01-24 - 2016-01-29 2016.

Hausner, Vera Helene. What kind of science do we need to create sustainable pathways in the Arctic?. Roundtable An information-sharing forum for the NCEAS community

Communicated Results

Presentation of RConnected at the MIKON, FRAM center meeting, 2015.

Ehrich, Dorothee; Thuestad, Alma Elizabeth; Tømmervik, Hans; Fauchald, Per; Hausner, Vera Helene. A circumpolar comparison of visible land use associated with socioeconomic conditions in six Arctic regions. Arctic Frontiers 2016-01-24 - 2016-01-29 2016.

Hausner, Vera Helene. What kind of science do we need to create sustainable pathways in the Arctic?. Roundtable An information-sharing forum for the NCEAS community 2016-10-14 - 2016-10-14 2016.

Hausner, Vera Helene. Global changes in local ecosystem services in Alpine and Arctic regions in Europe (introduction to session). European Ecosystem Services 2016 conference 2016-09-19 - 2016-09-23 2016.

Hausner, Vera Helene; Rebich Hespanha, Stacy. Identifying research gaps and needs in arctic ecosystem services research by modelling of large textual data sets. European Ecosystem Services 2016 conference 2016-09-19 - 2016-09-23 2016.

Ehrich, D. Inhouse meeting at UiT about local land use in the Arctic

Interdisciplinary Cooperation

We have created new theories and models within the field of sustainability science that is interdisciplinary, and which also included ecology, economic geography, sociology and environmental sciences. We think interdisciplinary cooperation benefit from using models/theories for answering interdisciplinary research questions, and preferably an “agreed upon” design. We think it is positive that we are a core team which have worked together for a while, and then add the competence we need for solving the different research questions. Our work in RConnected would benefit from including an anthropologist that understand quantitative or mixed-methods approaches, which we hope to solve next year.

Budget in accordance to results

The funding from the FRAM Centre allowed us to combine funding from CONNECT and MIKON to bring the Nordic countries into our circumpolar studies and to couple new layers of data with our existing databases. Particularly, the topic modeling and the resource curse papers were not originally a part of the “mother project” CONNECT. Funding from the FRAM centre also provides extra incentives for university researchers to focus on issues of relevance for MIKON; that is, to prioritize research on industrial development.

Could results from the project be subject for any commercial utilization

No

Conclusions

We have progressed as planned, with the exception of the Flickr data, which need more work to separate the photos taken by locals and tourists. This first year has primarily been used to finalize the datasets and publish on data from Canada, Alaska and Russia. Next year we will continue with the Nordic countries and the circumpolar socio-ecological analyses in relation to tourism – and industrial development.