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
2017

Project leader
Vera Helene Hausner (UiT)

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
All arctic

Participants

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

Claire A. Runge; UiT-Arctic University of Norway

Dorothee Ehrich; UiT-Arctic University of Norway

Else Grete Broderstad; Center for Sami Studies, UiT.

International partners (funded by CONNECT). Jennifer Irene Schmidt; University of Alaska, Anchorage; Konstantin Klokov, SPSU

Flagship
MIKON

Funding Source

MIKON, BELMONT FORUM, UiT, NINA

Summary of Results

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).

We are currently developing a measure for global connectedness measured by: the costs of travelling and sending goods to the Arctic; Flickr pictures for tourism; presence of extractive industries; and internet and communication infrastructure. We need to complement the existing data with phone surveys to create measures on local levels. We have found a way to separate Flickr photos taken by locals and tourists, and checked the reliability of using these photos for monitoring large scale tourism in the Arctic. We have also found an automatic classification method for ecosystem services using Flickr.

We are working with a manuscript on the impact of tourism booms in the Arctic, and we have finished a manuscript on the relationships between local communities and extractive industries in Russia. 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. Finally, we have finished the analyses of fish-and wildlife resources for the western Arctic, resulting in two publications. The quasi-experimental design/analyses of extractive industries is remaining.

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 sustainability challenges by linking environmental changes to social dimensions (i.e.; the three Ps: 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 will be submitted in the beginning of 2018).

- 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, IJC 2017).

- 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. Sci Adv. 2017).

- Local land use in the Arctic Russia and North-America is determined by regional differences and access to cash income (Ehrich et al., ms submit by end of 2017).

- One of the assumptions in the local resource curse theory predicts that extractive industries could erode relationships between locals and public institutions over time. 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 to be submit by the

end of 2017).

- The inuit subsistence users in North America generally have a positive attitude to public institutions, with the exception of Churchill where the port and a hydroelectric power plant have caused dissatisfaction with the governing institutions (Schmidt et al., Lokken et al., submit by end of 2017).
- Norwegians generally have high trust to public institutions, but for fish-and wildlife management and land development the relationship to governing insitutions are highly influenced by the establishment of the Finnmark Estate (Broderstad et al., 2017, in review J. of Rural Studies)
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Master and PhD-students involved in the project

Nils Lokken was originally a MSc student from U. of Saskachewan working with his thesis in CONNECT. Abigail Kidd is a PhD student from Utah State University.

For the Management

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. In North America and Norway resource extraction has less importance for the local attitudes to fish-and wildlife management.

Published Results/Planned Publications

Only RConnected

Hausner, V.H. & Rebich ,S. .2018. Gaps in needs in socio-ecological research in the Arctic (expect to submit ms before 3rd of March 2018)

Runge, C. Hausner, V.H. Daigle, R. 2018 Global connectedness and ecosystem services tourism hotspots in the arctic, ms in prep.

Kidd, A., Monz, C., Hausner, V. H., Schmidt, J. I. & Clark, D. 2018 Nature-based tourism, resource dependency, and resilience of Arctic communities: Framing complex issues in a changing environment, ms in prep.

In collaboration with CONNECT

Fauchald, F. Hausner, V.H Schmidt, J., Clark, D. (2017). Transitions of socioecological subsistence systems in the Arctic. International Journal of the Commons, 11 (1),

Fauchald, P.; Park, T.; Tømmervik, H.; Myneni, R. B.; Hausner, V. H. Arctic greening from warming promotes declines in caribou populations. Science Advances 2017; Volum 3:e1601365 (4). ISSN 2375-2548.s doi: 10.1126/sciadv.1601365.

Broderstad, E. G., Hausner, V.H., Josefsen, E., & Søreng, S. U. 2017. "Being the master in one's own house:" Support to the new Arctic land management arrangement in Finnmark, Norway, In review *J. of Rural Studies*.

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).

Klokov, K., Ehrich, D.E. & Hausner, V.H. Extractive industries and trust in resource governance in the Russian Arctic. (To be submitted before 31st December).

Schmidt, J. I., Clark, D., Lokken, N., Lankshear, L. & Hausner, V. H. 2017. Trust in Arctic Resource Management Agencies: a comparison of community perspectives from northwestern Alaska and western Hudson Bay, Canada, to be submitted to Environmental policy & governance in November 2017.

Lokken, Nils A.A., Clark, Douglas A., Broderstad, E-G., and Hausner, V.2017. Inuit attitudes towards co-managing wildlife in the communities of Igluligaarjuk, Tikirarjuaq, and Qamani'tuaq in the Kivalliq Region of Nunavut, Canada, to be submitted to the Arctic by the end of 2017.

Conferences:

Ehrich, Dorothee; Thuestad, Alma Elizabeth; Tømmervik, Hans; Fauchald, Per; Hausner, Vera Helene (2016). 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 (2016). 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 (2016). 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

Lennert, A. E. and Hausner, V. H. (2017) Connecting cultures of knowledge, -enhancing adaptive and flexible management of marine resources in a time of global and environmental change., 24th International Symposium on Society and Resource Management; Umeå, Sweden, June 19-22, 2017

Fauchald, P. and Hausner, V. H. (2017) Adaptive management of dwindling herds of Arctic caribou under climate change, 28th International Congress for Conservation Biology, Cartagena, Colombia, 23.-27th July, 2017

Communicated Results

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

Ehrich, D. Inhouse meeting at UiT about local land use in the Arctic, 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, 2015

Hausner, V. H. 2017. Global connectedness and changing resource use systems in the Arctic, Klimaforsk møte, 9. Juni 2017.

Interdisciplinary Cooperation

We have created new theories and models within the field of sustainability science, relevant for disciplines such as 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.

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. Topic modelling, socioeconomic data on accessibility, tourism, extractive industries, and costs of travelling/transporting goods to the Arctic are datalayers that could be added as a result of RCONNECTED. 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, which in our case is tourism and extractive industries.

Could results from the project be subject for any commercial utilization

No

If Yes

No, the products produced from this project are not to be used for commercial purposes or financial gain.

Conclusions

We have progressed as planned, and resolved the problem we originally had with photos taken by locals and tourists. We have finalized most of the datasets and published on data from Canada, Alaska and Russia. Next year we will continue with circumpolar socio-ecological analyses in relation to tourism – and industrial development.