Environmental and social sustainability of critical mineral extraction in Greenland

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Project Highlights:

- Receding ice in Greenland due to climate change is exposing largely unexplored mineral resources needed for the global energy transition
- This project investigates synergies and trade-offs between the environmental and social sustainability of mineral extraction in Greenland
- Sustainability research on mineral extraction is critical for ensuring responsible and ethical resource development

Overview:

The progressing ice melt in Greenland is exposing new critical mineral resources, which has been framed as a new 'frontier' for mineral exploration and extraction. This has attracted media attention, with reports calling the rapidly increasing interest in mining for critical minerals in Greenland a 'gold rush' (Energy Monitor, July 3rd 2023). In contrast to other contemporary resource frontiers such as deep-sea mining and space exploration, Greenland poses a unique setting of environmental sustainability transition challenges in a fragile polar environment (e.g. carbon emissions, landscape change, water quality and biodiversity impacts) intertwined with social sustainability challenges (impact on local communities, cultural values, just transitions and working conditions).

Figure 1: Receding ice opens up new resource frontiers for critical mineral extraction in Greenland, but environmental and social sustainability need to be considered. (Image of Ittoqqortoormiit, Greenland by anniespratt on Unsplash (CC-0 license) [Alt text: Decorative image of Greenlandic village showing colourful houses])

Mineral extraction in Greenland is situated in a national discourse for economic development and financial independence as a pathway to political independence (Hastrup & Brichet, 2022), as well as a geopolitical context of mining for minerals critical to the global energy transition (Woon & Dodds, 2021). Trade-offs between environmental and social sustainability need to be carefully considered in the context of the political economy and geopolitical questions in relation to Greenland's self-rule and its role as an independent Arctic nation in a contested Arctic region.

Previous research focused on social impacts of resource extraction in Greenland prior to the current conditions of melting ice (Hansen et al., 2016; Nuttall, 2015). In the context of new environmental conditions under climate change, critical mineral extraction in Greenland is expected to involve substantial ecological, social and economic transformations (Nuttall, 2017). Novel research that takes this new 'resource frontier' into account has previously focused on the public acceptance of sand and sediment extraction (Bendixen et al., 2022), but there is currently still a lack of research on the sustainability of critical mineral extraction in Greenland in the context of an envisioned just transition for the Arctic (DeSimone et al., 2023).

This project will therefore analyse environmental and social sustainability of critical mineral extraction in Greenland by assessing the sustainability through case studies of the existing and proposed policy and management regimes and the connection to global demands for socially and environmentally responsible mineral extraction.

Methodology:

A case study approach with two sites will be used, one where a critical mineral resource extraction is currently planned and one ongoing. A document and policy analysis will assess the extent to which environmental and social sustainability is being considered from global drivers (e.g. international Sustainable Critical Minerals Alliance or the International Labour Council Just Transition guidelines) to national policy frameworks. Expert interviews with stakeholders and scholars will be used to assess the extent to which environmental and social sustainability are currently considered. Semi-structured interviews with members of local communities will be conducted to explore how social sustainability is embedded in mineral extraction frameworks. This will be complimented by (and contrasted with) interviews with policy experts both from Greenland and in key international institutions. A qualitative analysis of trade-offs will be used to assess the degree to which aspects of sustainability of critical mineral mining are conflictive or synergetic

Possible timeline:

Year 1: Literature review, project design, ethics approval for fieldwork and fieldwork preparation by establishing contact with stakeholders

Year 2: Fieldwork in Greenland for data collection, data analysis and presentation of initial results at relevant conference

Year 3: Final analysis and thesis preparation, publication of peer-reviewed articles

Training and skills:

TARGET researchers will participate in a minimum of 40 days training over the 3.5 years of study composed of:

- an annual one-week workshop dedicated to their year group, and tailored to that cohort's needs in terms of skills development – *for the first three years of their study*;
- an annual all-TARGET workshop with cross-year interactions, advanced training and opportunities to specialise in particular areas – *all years of study*;
- a number of one-day workshops;
- additional online events and in-person workshops attached to relevant conferences.

In addition to the training provided through TARGET, the successful applicant will also become part of the Postgraduate Research College at the University of Aberdeen (https://www.abdn.ac.uk/pgrs/) which offers trainings and skill building opportunities across a range of topic areas from academic writing, analysis and others. Depending on the successful candidate's background the supervisory team will also offer bespoke training and mentor the candidate in developing a balanced skill set throughout their PhD.

Partners and collaboration (including CASE):

The successful applicant will be supervised by an interdisciplinary team spanning environmental, geosciences and social sciences. The main supervisor will meet with the successful applicant on a bi-weekly basis and act as a mentor during the PhD process. The successful applicant will benefit from monthly meetings with the entire supervisor team. Regular exchange with co-supervisors (TARGET partner) in Liverpool, and external supervisor in Denmark, are central to the PhD experience. The successful candidate will engage with industry and other governmental and non-governmental actors throughout the PhD.

Further reading:

Hansen, A. M., Vanclay, F., Croal, P., & Skjervedal, A.-S. H. (2016). Managing the social impacts of the rapidly-expanding extractive industries in Greenland. The Extractive Industries and Society, 3(1), 25–33.

Hastrup, F., & Brichet, N. (2022). Mining for Greenlandic self-government: Fractal islands in the Anthropocene. Island Studies Journal, 17(1), 123–140.

Sørensen, D. B., & Yearsley, C. (2024). The Green Transition: Are Greenland's Critical Raw Material deposits the key to the EU's net-zero future? https://thinkeuropa.dk/brief/2024-08-the-green-transition-are-greenlands-critical-raw-material-deposits-the-key-to-the-eus

Further details:

Please visit https://target.le.ac.uk/ for additional details on how to apply.
For any queries about the project please get in touch with the main supervisor Dr. Flurina Wartmann at flurina.wartmann@abdn.ac.uk /