



Arctic biodiversity, climate and food security

POLICY BRIEFING



CHARTER, ECOTIP and FACE-IT are EU-funded, Horizon 2020 projects that aim at contributing to a better understanding of how the several drivers of Arctic change are impacting on ecosystems and, in turn, on Arctic communities, especially in connection with the observed Arctic ice shelf loss. These three projects focus respectively on Arctic ecosystems on land, at sea and in the interface between land and ocean (fjords) while exploring and identifying potential opportunities for co-management to adapt to the ongoing changes. We believe that already the preliminary results deriving from these research projects are highly relevant for the strategies being developed by the European Union and the work of other international organisations in relation to the climate change and biodiversity crises.

Relevance for EU's Arctic policy and the Green Deal

The EU role in guiding trends and shaping policies that have a critical impact for the Arctic region and the local stakeholders is crucial. International cooperation, trade, tourism, pollution, the exploitation of natural resources, and fundings for research programs are relevant areas and tools for EU's action. The 2021 EU's Arctic policy emphasizes that the Green Deal should guide the EU's Arctic engagement in the coming years.

Specific economic activities are developing quickly in the Arctic, including tourism, fisheries and aquaculture. They are expected to play an important role for local economic development and diversification. However, there is an obvious challenge in developing such activities in a way that considers the interests and well-being of local inhabitants, but also ensures the protection and conservation of fragile ecosystems. There is a need for prioritizing quality over quantity, while resources are often lacking to develop and enforce regulations and guidelines in the Arctic.

Preliminary findings from both FACE-IT and ECOTIP indicate that marine food resources are predicted to continue to be of commercial importance, but must also sustain local livelihoods and culture. However, the ongoing "borealisation" of marine species above the Arctic circle is impacting fisheries, as emphasized by ECOTIP that has documented changes in fish distribution with the help of historical data and interviews with fishers. The development

of the seaweed aquaculture sector shows potential as a new livelihood, as well as being important for habitat provision, ecosystem services, and carbon sequestration. Europe's demand for marine food resources from the Arctic needs to be balanced with sustaining local and traditional practices and ecosystem function. Besides, EU policies must consider the priorities of the Arctic coastal states when it comes to fishery rights to prevent situations of conflict.

On land, reindeer husbandry is a traditional, viable and vital livelihood with high symbolic significance and with an important landscape management function. It has been shaping Northern landscapes, and is an integral part of landscape dynamics as it contributes to keeping them open, as emphasized by preliminary findings from CHARTER. There are nevertheless conflicting interests with other forms of land-use, such as forestry, tourism, resource extraction and green energy. In connection with the expansion of the latter activities, reindeer herders are poorly empowered to provide what should be their crucial contribution into land-use management regimes in the Nordic countries. Sustaining biodiversity, mitigating climate change, preserving the interests of local and Indigenous communities, and fully embedding traditional knowledge in strategies and plans are topics that are strongly interlinked. Current trajectories of development and regional and local livelihoods must be better integrated when considering land-use.

Relevance for the work of IPCC and IPBES

Both the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) provide scientific and policy relevant knowledge regarding climate change and biodiversity evolutions. Arctic research is providing large amounts of data and results that help address critical knowledge gaps identified in the IPCC and IPBES reports. Long-time series are particularly useful for improved modelling and to better analyse cryosphere changes and ecosystem evolutions, but also to further our understanding how different aspects interact with each other in a complex system.

Knowledge held by the local communities, especially Indigenous people, is as important as scientific data collection and modelling. Natural resources management practices, such as reindeer herding and

fishing, among others, are likely to be central not only in preserving biodiversity and adapting to and mitigating climate change, but also in safeguarding and keeping alive the heritage of traditional Arctic cultures.

While the rate of climate and environmental changes in the Arctic is high, data are still limited in space and time. Their collection on a continuous, ongoing base is crucial to validate global trends, especially in detecting and understanding non-linear regime shifts, that translate into better plans for climate adaptation and mitigation and ecosystem conservation. However, Arctic research mostly focuses on climate change impacts on ecosystem services and livelihoods at a local and regional scale. Further work is urgently needed to connect existing knowledges and to widen the geographical coverage and relevance of data collection and modelling at the pan-Arctic scale.

Relevance for the EU's missions

The European Commission's research program Horizon Europe crucially contributes, among other objectives, to the implementation of five missions, that have been designed to address epochal challenges. Three of them are relevant for research focusing on climate change and biodiversity in the Arctic ("Adaptation to Climate Change", "Restoring our Ocean and Waters by 2030" and "Climate-Neutral and Smart Cities").

Data, models, and contribution from multiple knowledge fields are necessary to co-develop strategies that address climate risks and build resilience against the impacts of climate change for all sectors of the Arctic economy and societies and for the Arctic ecosystems. It is then possible to design relevant policies to minimise the risks, mitigate the changes, and take advantage of the projected evolutions in ecosystem services and their impacts on local livelihoods. However, EU policies are designed in a global perspective, while regional and local ecosystem changes and trends observed in the Arctic are insufficiently addressed.

Ongoing research projects help to assess the current situation and to predict future direct and indirect impacts of terrestrial, ocean and fjord warming, snow

onset and melt, permafrost thaw, sea ice reduction, and the increased frequency of extreme weather events. These drivers affect ecosystem services and local and indigenous cultures and livelihoods. Moreover, collecting and analyzing data from the lower Arctic is relevant to better understand ecosystems trends in the high Arctic. It is therefore necessary to link analyses and observations at a local scale with the broader changes that affect the whole Arctic region.

Challenges are emerging for environment protection, and scientific knowledge on the impact of human activity on Arctic ecosystems is lacking, both on land and at sea. The pressure on these ecosystems is increasing due to rapidly expanding activities, such as tourism, increased marine traffic and new land infrastructures, as well as potential future threats deriving from oil, gas and rare earth minerals extraction. Simultaneously, new environmental conditions and retreating sea ice are bringing economic opportunities. Future policies will have to carefully manage both these aspects, while also better including local and Indigenous peoples. Close cooperation between local municipalities, communities and other locally involved actors should also be facilitated with a focus on developing a sustainable society, while leading to zero greenhouse gas emissions.

ECOTIP

Investigating ecological tipping points
in the Arctic Seas

www.ecotip-arctic.eu

Twitter: @ecotiparcticEU

Instagram: @ecotiparctic

Facebook: @EcoTipArctic

CHARTER

Changes in Arctic Terrestrial Biodiversity

www.charter-arctic.org

Twitter: @CharterArctic

Facebook: @arcticcentre

FACE-IT

The future of Arctic coastal ecosystems – Identifying
transitions in fjord systems and adjacent coastal areas

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These projects have received funding from the
European Union's Horizon 2020 research and
innovation programme under grant agreement
No 869383 (ECOTIP), No 869154 (FACE-IT), and
No 869471 (CHARTER)

