Resource Extraction and Arctic Communities

The New Extractivist Paradigm

Edited by Sverker Sörlin

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RESOURCE EXTRACTION AND ARCTIC COMMUNITIES

For decades, a post–Cold War narrative heralded a “new Arctic,” with melting ice and snow and accessible resources that would build sustainable communities. Today, large parts of the Arctic are still trapped in the path dependencies of past resource extraction. At the same time, the impetus for green transitions and a “new industrialism” spells opportunities to shift the development model and build new futures for Arctic residents and Indigenous peoples.

This book examines the growing Arctic resource dilemma. It explores the “new extractivist paradigm” that posits transitioning the region’s longstanding role of delivering minerals, fossil energy, and marine resources to one providing rare earth elements, renewable power, wilderness tourism, and scientific knowledge about climate change. With chapters from a global, interdisciplinary team of researchers, new opportunities and their implications for Arctic communities and landscapes are discussed, alongside the pressures and uncertainties in a region under geopolitical and environmental stress. This title is also available as Open Access on Cambridge Core.

SVERKER SÖRLIN is a defining voice in environmental history and a prize-winning author of scholarly and nonfiction books on intellectual history and on the history and politics of climate change. He has a career-long interest in natural resource extraction politics and history, and has chaired Sweden’s national committee for the International Polar Year 2007–2009.

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Edited by

SVERKER SÖRLIN
KTH Royal Institute of Technology

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Notes on Contributors

Dag Avango is Professor of History at the Division of Social Sciences, Luleå University of Technology. He has a scholarly background in archaeology and a PhD in the History of Technology. His research focuses on the history of industrial society, in particular extractive industries in the Arctic and Antarctic. Related fields are cultural heritage and environmental history. Based on the theoretical assumption that material objects and environments play an active role in society and therefore should be considered in explanations of historical change, his research is situated at the interface between archaeology and history. He led a number of large research projects on the historical relation between scientific research, extractive industries, and geopolitics, and has been principal investigator (PI) of the Nordic Center of Excellence REXSAC – Resource Extraction and Sustainable Arctic Communities since 2019.

Lill Rastad Bjørst is an associate professor at Aalborg University, Denmark. Her academic career has focused on enhancing the role of social and human sciences in Arctic research. Her scientific focus areas are Inuit culture, society, climate change, sustainability, mining, industrialization, extractivism, postcolonialism, and tourism. One particular strength of her research profile is her many years of experience with research management as a PI, a work package leader (WPL), and the head of CIRCLA: Centre for Innovation and Research in Culture and Living in the Arctic.

Malin Brännström holds a PhD in Law and is the director of the Institute for Arctic Landscape Research, INSARC, and the Silvermuseet in Arjeplog, Sweden. She is also affiliated with the Department of Law and the Arctic Research Centre at Umeå University. Brännström is a legal scholar specialized in research on natural resources, Sámi land rights, and reindeer herding. Her current work is about the role of history in decision-making processes and how the Swedish legal system handles opposing interests, land use conflicts, and property rights.

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Brigt Dale holds a PhD in Political Science and a master's degree in Visual Anthropology and is Research Director at Nordland Research Institute, Norway. His work focuses on societal transformation, (ontological) security theory, governmentality, biopolitics, and cultural theory, and on the relation between security, power, and resource management. Dale's empirical research includes the consequences of, and adaptation to, climate change, petroleum politics, and extractive industries and their impact on local communities, tourism, aquaculture, and cultural heritage. He has done fieldwork in Tobago (2001), the Lofoten Islands (2008–2010, and ongoing), Finnmark (2014, 2015), and Greenland (2014, 2019). Dale is an honorary professor at IBES Institute for Environment and Society at Brown University.

Thomas Hylland Eriksen is Professor of Social Anthropology at the University of Oslo. His textbooks in anthropology, including *Small Places, Large Issues*, and *Ethnicity and Nationalism*, are widely used and translated, and his research concerns unintentional consequences of modernity, cultural aspects of globalization, and local responses to accelerated change. His latest books in English are *Overheating: An Anthropology of Accelerated Change* (2016), *Boomtown: Runaway Globalisation on the Queensland Coast* (2018), and the coedited volume, with Marek Jakoubek, *Ethnic Groups and Boundaries Today* (2019). He is currently writing about the future of diversity in the light of accelerated globalization.

Sandra Fischer is a PhD student at the Department of Physical Geography at Stockholm University. Her research focuses mainly on water quality impacts from abandoned mines in northern Sweden. She has combined extensive water sampling campaigns in the field, laboratory work, and historical water quality records to contribute new insights about long-term metal contamination in colder climates, which were published in the journal *Sustainability*.

Anne-Cathrine Flyen is a researcher at the Norwegian Institute for Cultural Heritage Research and a PhD student at the Department of Architecture and Technology at the Norwegian University of Science and Technology. She has a scholarly background in architecture, and her PhD is within climate and human-induced degradation of cultural heritage in Arctic regions. Her research focuses on preserving important conservation values in physical buildings and built environments. Flyen has participated in EU-funded research projects in environmental monitoring and risk, and she has worked in Norway on the transformation of industrial heritage and biological degradation of cultural sites.

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Christian Fohringer is a research associate at the Department of Wildlife, Fish and Environmental Studies (VFM) at the Swedish University of Agricultural Sciences in Umeå, Sweden. As a PhD student in REXSAC, he examined the cumulative effects of land use and climate change on Arctic wildlife and Indigenous people. Through the lens of animal ecophysiology, he is combining an array of biomolecular, biotelemetry, and social-ecological approaches in order to identify where, when, and why animals and the communities that depend on them are most vulnerable to environmental stress.

Hannu I. Heikkinen is a professor of cultural anthropology at the University of Oulu. His research focuses on how human–environment relations and overall wellbeing and sustainability are mediated by culture and technology, particularly in Arctic and Northern societies. He is especially interested in participatory approaches, citizen science, resource rights, and environmental justice. Theoretically, he has focused on political ecologies of traditional livelihoods, cumulative impacts of industrial resource use, multispecies ethnography, and tourism. As a Docent of Environmental and Applied Anthropology, he has led and been involved in work on multiple transdisciplinary projects and in environment-related research institutions.

Vesa-Pekka Herva is Professor of Archaeology at the University of Oulu, Finland. His research interests encompass material culture, human–environment relations, and cosmology. He was PI of a major Academy of Finland-funded project “Understanding the Cultural Impact and Issues of Lapland Mining: A Long-Term Perspective on Sustainable Mining Policies in the North” (2014–2018). Herva has studied the European Arctic as a resource space from the perspective of extraction, tourism, and cultural heritage and is currently working on the cosmological dimensions of Arctic mining. He is the author, with Antti Lahelma, of *Northern Archaeologies and Cosmologies: A Relational View* (Routledge, 2019).

Arn Keeling is a professor of geography at Memorial University of Newfoundland, Canada. His research and publications focus on the historical geography and contemporary legacies of mineral development, environmental pollution, and remediation in the Canadian North. He is the co-editor of *Mining and Communities in Northern Canada: History, Politics, and Memory* (University of Calgary Press, 2015) and co-author of the book *Mining Country* (Lorimer, 2021), a general history of mining in Canada.

Teresa Komu is a post-doctoral researcher affiliated with the Arctic centre in the University of Lapland, Rovaniemi and with the University of Oulu, Finland. Teresa

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got her PhD in cultural anthropology with a thesis on the co-existence of reindeer herding, extractive industries, and nature-based tourism in northern Fennoscandia. Her research interests currently circle around the coexistence of competing livelihoods, northern human–environment relations, and the anthropology of the good. She has ten years of experience on doing research on Arctic mining from the viewpoints of participatory planning, land use conflicts, and cultural understandings of mining.

Joan Nymand Larsen is professor of Economics and Arctic Studies at University of Akureyri, Iceland, and research director at the Stefansson Arctic Institute, Akureyri. Her research focuses on Arctic economies and resource development, and the impact of industrial development, climate change, and global change processes for Northern regions and coastal communities. She has led work on Arctic human development and the study of living conditions and quality-of-life, including the construction of Arctic social indicators. Her current research is primarily field-based with a focus on close engagement with stakeholders in Greenland and in coastal zones across the Arctic.

Élise Lépy is an environmental geographer by training, with a PhD in Geography from the University of Caen-Normandy, France, and is currently a researcher at the University of Oulu. Her expertise is used in various international and multidisciplinary research projects on human–environment relationships in the Circumpolar North. She has built a long track record on Arctic environmental change and adaptation with a particular focus on climate impacts on traditional livelihoods. She explores the combined effects of multiple pressures on Arctic landscapes and communities, including Sámi, to understand the land use conflicts around natural resource extractions in Finnish and Swedish Lapland.

Marianne Elisabeth Lien is Professor of Social Anthropology at the University of Oslo. She has published widely on topics related to environmental issues and human–animal relations, and especially as they relate to food and domestication. She currently works in Finnmark, North Norway, where she has been doing fieldwork on and off since the mid-1980s, recently with a focus on resource extraction and colonizing practices. With Frida Hastrup, she has co-edited a special issue on *Welfare Frontiers: Resource Practices in the Nordic Arctic Anthropocene* (AJEC, 2020), and she is the author of *Becoming Salmon: Aquaculture and the Domestication of a Fish* (University California Press, 2015).

Judit Malmgren is a PhD-student in history at Luleå University of Technology. Her research examines the complex relationship between local Arctic communities

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and large socio-technical systems connected to mining. Growing up in a sparsely populated municipality in Arctic Sweden, Malmgren has closely experienced a region challenged with depopulation, dependent on natural resource exploitation for its development and survival, and with a large Indigenous population. This has given her an understanding of some of the complex challenges and dilemmas facing the Arctic region today.

Annika E. Nilsson is an interdisciplinary researcher with a PhD in Environmental Sciences. Her research focus is on the politics of Arctic change and environmental governance. Currently at Nordland Research Institute, Norway, she has previously been at Luleå University of Technology, KTH Royal Institute of Technology, and the Stockholm Environment Institute, Sweden. She has been engaged in several assessments under the auspices of the Arctic Council, as science writer as a well as lead author. A recent book is *Arctic Geopolitics, Media and Power* (Routledge 2019). Her current research applies participatory scenario methods to identify governance challenges in social-ecological-technological systems.

Carl Österlin, PhD, is a researcher at the Department of Physical Geography at Stockholm University. With a background in land use planning and systems analysis, his research focuses on multiple pressures on Arctic landscapes, particularly how climate change and resource extraction affect traditional Sámi reindeer herding. His PhD work documented the rapid increase in natural resource extraction in northern Sweden, a line of work that he has continued in several transdisciplinary research projects in collaboration with Sámi reindeer herding communities.

Tina Paphitis is currently a Marie Skłodowska-Curie research fellow at the Department of Culture Studies and Oriental Languages, University of Oslo. She is also a Visiting Research Fellow in Folklore at the University of Hertfordshire and a collaborative researcher on a project exploring the cultural significance of the underground in northern Fennoscandian extractive industries (Academy of Finland 2021–2025) at the University of Oulu. Her PhD at University College, London (2014) was on the medieval to contemporary folklore of archaeological landscapes, and her research interests include legends and landscapes in Britain and the Nordic region, environmental/ecocritical folklore, folklore and archaeology in fantasy and horror literature, and integrating folklore in critical heritage studies.

Albina Pashkevich is an associate professor in Tourism Studies at the Centre for Tourism and Leisure Research, Dalarna University, Sweden. Her research concentrates on Arctic tourism and contemporary uses of mining heritage. This includes representations of indigenous culture (Swedish Sami and Russian Nenets), tourism

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management, power relations, and institutional structures' impact on tourism development. Currently she is a principal investigator of a research project on "Mining heritage as a resource for sustainable communities: Lessons for Sweden from the Arctic."

Curt Persson is a senior lecturer in History at Luleå University of Technology. His research is focused on the history and heritage of industrial society and indigenous peoples, with a particular focus on the Fennoscandian Arctic. He has published on leadership and organization within the mining industry, and on the role of national minorities in mining and societal change. Another strand of his work concerns the Swedish state's abuse of the Tornedalian and Meänkieli-speaking minority in northernmost Sweden. Persson served for twelve years as director of the Museum of Norrbotten – Sweden's Arctic country museum.

Thierry Rodon is a professor of Political Science at Université Laval, Québec City and holds a Research Chair in Northern Sustainable Development. He leads MinErAL, an international research network on extractive industries and Indigenous livelihoods, with researchers and Indigenous partners in Canada, Australia, New Caledonia, and Fennoscandia. He is also the co-lead for the well-being theme on the *Modern Treaty Implementation Research: Strengthening Our Shared Future*. In addition, he has authored several publications on Indigenous policies and Arctic governance.

Gunhild Ninis Rosqvist has a professorship in Geography with an emphasis on Physical Geography at Stockholm University. She leads research in climate and environmental change and educates society through frequent outreach activities. She specializes on effects of climate change on mountain and polar environments, especially the cryosphere, and on mountain ecosystem services, especially reindeer herding. She was the director of Tarfala Research Station between 2005 and 2020, a Stockholm University infrastructure supporting Arctic and alpine environmental research and monitoring. Her annual measurements of the melting ice cap on the highest mountain in Sweden that dropped to the second highest are reported in media all over the world. Rosqvist has been the co-PI of REXSAC since 2016, developing cross-disciplinary research including traditional Sámi knowledge.

Simo Sarkki has a PhD in anthropology (2011) and holds the title of Docent in "anthropology of environmental governance" at the University of Oulu (2013), Finland. Sarkki has worked in various research projects related to environmental governance. His research interests include science–policy interfaces, social innovations, land use in northern areas, qualitative scenarios, participatory approaches,

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and multi-level governance under the broader theme of environmental governance. He is especially interested in understanding how spheres of society, science, and policy interlink in environmental decision-making.

Frank Sejersen is an associate professor in the Department of Cross-Cultural and Regional Studies, University of Copenhagen. He pursues research within the field of anthropology and political ecology. His analytical focus is on cultural transitions, knowledge conflicts, environmental perception, and policies of sustainability. The regional focus is on the Arctic, where questions of climate, urbanization, indigenous rights, and societal dynamics are integrated into a larger analytical field of scaling practices, cultural translation, and identity politics. Ongoing work is on innovation, affective economies, and place- and future-making, themes that are also the focus of his book *Greenland and the Arctic in the Era of Climate Change* (Routledge 2015).

Zdenka Sokolíčková is a teaching and research associate at the Department of Studies in Culture and Religion, University of Hradec Králové, Czech Republic. In 2019–2022 she was a guest researcher at the Department of Social Anthropology, University of Oslo, mentored by Thomas Hylland Eriksen. Since 2021 she has worked as a postdoc at the Arctic Centre in Groningen, the Netherlands. Her research interests lie in the fields of anthropology of climate change, the Arctic, tourism, and migration, as well as transdisciplinary research on Svalbard's environmental memory.

Sverker Sörlin is a professor in the Division of History of Science, Technology and Environment at the KTH Royal Institute of Technology, Stockholm, where he also works with the KTH Environmental Humanities Laboratory. His current work includes the science politics of the cryosphere, climate change, and the Anthropocene. He has had a long career as a government advisor on research and environmental policy and served in the 2000s as the President of the Swedish Polar Committee and the National Committee for the Fourth International Polar Year. Among his books on Arctic topics are the edited *Northscapes: History, Technology, and the Making of Northern Environments* (UBC Press, 2013), *Science, Geopolitics and Culture in the Polar Region* (Ashgate, 2013), and *Ice Humanities: Living, Thinking and Working in a Melting World* (Manchester University Press, 2022).

Leena Suopajärvi works as a university lecturer in the Faculty of Social Sciences, University of Lapland, Rovaniemi. She is also an adjunct professor at Oulu University, Faculty of Technology. Her special field is environmental sociology,

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especially themes related to natural resource governance from the point of local people in Finnish Lapland. In recent years, she has participated in numerous multidisciplinary projects and, for example, studied social impacts of mining and social license to operate (SLO).

Kirsten Thisted is an associate professor in the Minority Studies section, Department of Cross-Cultural and Regional Studies, University of Copenhagen. She works across the disciplines of literary theory, language, history, and cultural studies, with a focus on how asymmetric power relations are negotiated. Her research has focused on the (literary) history of modern Greenland and Greenland–Denmark relations. She led an interdisciplinary project resulting in the two-volume work *Denmark and the New North Atlantic – Narratives and Memories in a Former Empire* (ed. with Ann-Sofie N. Gremaud, Aarhus University Press, 2020).

Camilla Winqvist is a PhD student in the Division of History of Science, Technology and Environment at KTH Royal Institute of Technology, Stockholm. Her thesis aims to explain under what circumstances legacies from mining in the past can become resources for communities in transition in the Fennoscandian Arctic. Her work explores different forms of re-use, environmental remediation, and ways to create new sources of income at abandoned mining sites. Winqvist uses methods and sources from history and archaeology, combining archival research, interviews, and field work at abandoned mining sites.

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Preface

In this book, three big topics meet: resource extraction, local communities, and the Arctic. When we set out on a major research enterprise together in 2016 as part of the NordForsk initiative Responsible Development of the Arctic – Opportunities and Challenges – Pathways to Action, we already knew that all three were undergoing profound change and were under considerable stress due to a confluence of several factors. These did not just include environmental and climate change but also an increased political focus on sustainability and Indigenous rights, conflict on the ground over mining and renewable energy production, and mounting geopolitical tension around oil and gas, rare earth metals, and marine resources.

Environments of the Arctic were changing rapidly, especially climate due to the well-established "Arctic amplification." Based on then-recent scientific work, the rule of thumb used to be that climate change was twice as fast in the Arctic compared to the global average. Just a decade later, by 2021, the most recent research, and reports from the IPCC, had increased Arctic amplification up to treble or quadruple the rise in global temperature, with the rapid loss of summer sea ice, shrinking snow cover of shorter seasonal duration, and increased amount of anthropogenic soot as some of the crucial drivers. To the increased heat absorption is added an accelerated influx of northbound heat from tropical and temperate regions.

Arctic resource extraction has a history of hundreds of years, with the bulk of it pursued by southern states, often in a colonial fashion with little profit staying in the region. Mining covers a good deal of that period, but the quantities of extraction, minerals, oil, and gas have never been bigger than in the last two decades, and amplitudes between years have never been wider, with a boom in the beginning of the twenty-first century. Prospecting, terrestrial and maritime, has never been more intense following liberalization policies from the end of the Cold War, rising globalization, and the rapidly increased demand for steel and rare earth

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metals in China and other growing economies. A much-cited 2008 study by the United States Geological Survey, indicating that the region held as much as 30 percent of the world's undiscovered oil and gas, did much to animate the Arctic as a resource space for the future.

We also knew that Arctic communities for a long time had lived in complicated relationships with environmental and economic change, some clearly unhelpful to building and strengthening resilient local livelihoods. Our ambition was to research opportunities for these northern Indigenous and settler communities to find continued or even expanded resource extraction more useful, hopefully desired. We were eager to lay out a brighter future for Arctic communities under a reformed regime of resource extraction, with a more critical process of selecting mining sites and where more consultation, social licensing, and revenue sharing was the norm. The backdrop was a checkered history of extractive industries in the Arctic, certainly with a lot of variation between periods and between states and regions; and a complicated relationship with a climate emergency that was looking to the Arctic region, itself a prime victim of the emergency, for critical metals and renewable energy that could help underpin a sustainability transition. The Arctic, all of a sudden, ranked high in virtually all critical dimensions of global change.

Finally, we also knew that the Arctic wasn't one, but several Arctics. We looked in particular to the European Arctic, which means that the Nordic countries, including Greenland, took a central position, but we also had members of our research team covering Russia, Canada, and the United States.

That was the remit, and the spirit, of the NordForsk Responsible Development of the Arctic program that has funded our research in a Center of Excellence called REXSAC – Resource Extraction and Sustainable Arctic Communities – from 2016 through to 2022. REXSAC as a whole comprised more than fifty researchers and research staff, including ten PhD students and collaborating members of Indigenous communities. Altogether we represented about a dozen scientific specialties in fifteen universities and institutes located in seven countries.

To research these challenging issues has been extremely stimulating and at times discombobulating. It has made us think in new ways, break from old assumptions, and discover new connections. We have found some progress and reasons for hope. We have explored ways of transitioning from extraction to post-mining futures and wiser forms of collaboration and consultation. We have seen alliances form between multiple actors to find new ways forward for sustainable development, and a growing awareness of the acute danger that comes with climate change.

However, we have also seen inertia, inaction, and a resistance to accept caution, restraint, and responsibility. The empirical realities we have observed have not always been consistent with hopes we held at the outset. We have rather found that

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resource extraction so far tends to continue a path-dependency of producing and reinforcing pressures on local, especially Indigenous, communities. Technological advances, environmental regulation, and local partnerships have had positive effects, and some of the ongoing extraction stands a good chance of assisting in the decarbonizing effort. But it is far from obvious that these advances will outweigh the insensitive interventions into virgin environments and the high demands on resources, landscapes, cultures, and livelihoods that the expanding extraction creates.

All in all, we see a more complex and problematic Arctic than many envisioned when the Cold War ended, but one that is even more solidly central to the future of both the planet and the world.

Sverker Sörlin
Stockholm, September 2022

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Acknowledgments

This book is the result of a great team effort lasting over seven years, from developing the original research design through a long period of research in the field, in archives and libraries, and including many small and large publishing endeavors, through to this volume. It tries to bring a mass of results together into a more coherent image of state-of-the-art knowledge on Arctic resource extraction.

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Key to the success was the constructive support from the NordForsk program officers, Marianne Røgeberg in the preparatory and start-up phases, and since 2018 Kyösti Lempä. An additional source of inspiration and support – and challenge! – was the international Scientific Advisory Board, chaired by Professor Douglas

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C. Nord, Umeå University, Sweden. En route, Doug took it upon himself to coordinate and edit a NordForsk Arctic program–wide collection, entitled *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action* (Springer Nature, 2021), a book that allowed us to get our heads together and test some of the ideas that we have explored in depth in the present volume.

Outside the team of authors, several members of the CoE as a whole have contributed to the work in myriad ways. In different constellations, the authors and other REXSAC co-workers, including Indigenous and community representatives, have conducted fieldwork, PhD training courses, and excursions to multiple locations of mining, energy production, and other forms of resource extraction and their surrounding communities. On such occasions, we have been thoughtfully and convivially taken care of by colleagues and local experts. Among those were Britt Kramvig in Alta and Urban Wråkberg in Kirkenes, Norway; Malin Brännström in Arjeplog, Åsa Allan in Pajala, Anders Forsgren in Gällivare, and Nina Eliasson, Clara Nyström, and Niila Inga in Kiruna, all in Sweden; Vili Kurki, Mikko Lipponen, Jaana Koivumaa, Élise Lépy, and Hannu I. Heikkinen in Kolari, Finnish Lapland; Joan Nymand Larsen and Jón Haukur Ingimundarson in Akureyri, Iceland; Mark Nuttall, Lene Kielsen Holm, and Erik Kielsen in Narsassuaq, Narsaq, Arsuk, Ivittuut, and Josva, Greenland; Thierry Rodon, Aude Therrien, Jean-Sébastien Boutet, and Arn Keeling in Schefferville and Labrador City, Québec, and Réal Mckenzie, Matimekush Lac-John, all in Canada.

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Sverker Sörlin

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Introduction

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1

The Extractivist Paradigm

Arctic Resources and the Planetary Mine

SVERKER SÖRLIN

Our current world is an extractivist world. We are all entangled in it, some of us more than others. At the same time, minerals and other extractable resources have been the companion of humans for eons, and they are essential for understanding how the modern world became what it is. Humans have become an extractive species, alongside being a harvesting one. For hundreds of thousands of years, "humanity" was a planetary handful living off live organisms they could find or kill. They also used minerals for colors and tools (Goody, 2012). Mines for red ochre have been found in Swaziland that are more than 40,000 years old, possibly 80,000. Other mines, almost of the same age, both pits and subterranean, existed in what is today's Egypt, Australia, France, Spain, Belgium, Poland, Hungary, and North America. Over the last ten thousand years of the Holocene, humans gradually started herding and domesticating animals, growing their own food and thus expanding in numbers. Metals became part of the tools of sedentary life forms, and technologies of smelting were in wide use in the Ancient world on several continents thousands of years back (Killick & Fenn, 2012; Hansen, 2017; Humphris et al., 2018; Bebber et al., 2019).

Nonetheless, it is only in the last millennium, and in particular the last two hundred years, that humans have extracted mineral and fossil resources from the earth on a major, and rapidly accelerating, scale. The growth in the extraction and use of minerals, including rare earth minerals, has been astronomical. Global data collected since 1913 by the British Geological Survey show that production of major metals such as copper and iron grew by a factor of 7 and 5, respectively between 1913 and 1970, and again by a factor of 3 and 4, respectively, between 1970 and 2019. In other words, in a little over a century the use of both metals grew by approximately a factor of 20. If we extend the period of comparison back to 1880, the total amount of metals extracted has grown by a factor of 100, with iron making up the bulk of it (IMRB, 1921; IGS, 1978; Brown et al., 2021[1]).

This pattern of recent and dramatic growth is most pronounced for strategic metals and rare earth elements, many of which were discovered and/or used

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actively only in the twentieth century for a range of military and industrial purposes. Growth rates of these elements have been even more dramatic, especially in recent decades, not because of any general shortage – these “rare earths” are not rare at all but quite dispersed – but because of the many hazards and the environmental, health, and social consequences of extracting them (IMRB, 1921; IGS, 1978; Klinger, 2015; Brown et al., 2021). If we look at the special case of fossil fuels, numbers show that more than 80 percent of all fossil coal used and almost 100 percent of oil and gas have been extracted since 1900. In total this means that of all fossil fuels used more than 95 percent have been used after 1900 and more than 50 percent after 1990 (Ritchie & Roser, 2020).

Mainstream capitalist and socialist societies today live off extraction in ways and with an intensity that would have been incomprehensible to past humans. The industrial revolution was founded on iron and steel. The profound dependency on minerals and fossil fuels is relatively recent, and it has accelerated dramatically since the middle of the twentieth century. Metals are all around us. Any large building holds hundreds or thousands of tons of steel. Millions of miles of communication cables are made of copper. The cell phones in our pockets have rare earths, gold, cobalt, and lithium inside and come at considerable environmental and energy costs (Jardim, 2017). Even artificial intelligence, touted as the immaterial, low-cost future of data, is full of metals and requires constant energy charging and is more realistically understood as, after all, just another technology of physical resource extraction (Crawford, 2021).

Arctic Extractivism

The everyday facts mentioned earlier are not specifically about the Arctic, but they are relevant for understanding the Arctic and its role as part of the modern global excavation and circulation of minerals. A central point of departure for this book about resource extraction in the Arctic is how firmly the dangerously growing human impact on our small planet is tied to a *framing mind of resource extractivism*. For a few generations, expansion of resource extraction and circulation has been a fundamental modus operandi for economic growth and diplomatic and military forms of geopolitics. An element of this *extractivist paradigm* has become its increasing decoupling of the extraction site from the cultivation of human settlement. This is an old trope in the discussion of mining and extraction, gaining ground in the critique of “boom and bust” bonanzas in the nineteenth century, such as gold rushes in Alaska and Yukon, the rapacious Bering Sea seal fur hunting, and since then a stereotype (Morse, 2003; Brockington, Duffy & Igoe, 2008; Bridge, 2009; Demuth, 2019). Despite the critique and the well-known downsides of being rich in natural resources, sometimes called the

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"resource curse," that tend to keep resource-rich communities and nations in poverty (Humphreys, Sachs & Stiglitz, 2007; Ross, 2012; Smith & Waldner, 2021), this framing mind has showed few signs of waning. On the contrary, the territorial decoupling has continued and expanded into new ways of extracting resources without sustainable physical presence and lasting responsibility, presenting not just a threat to local sites and communities but also a much less fortunate route forward for the human–earth relationship than the one projected by the United Nations Agenda 2030 goals and institutions.

How should we understand this? In the theoretical literature, there is an increasing openness to regard extractivism as a historically expanding phenomenon, underpinned for several decades by a globalizing logic. One of the foremost voices in this field, Alberto Acosta (2013, 2020), provided this definition of extractivism: "we will use the term extractivism to refer to those activities which remove large quantities of natural resources that are not processed (or processed only to a limited degree), especially for export." First emerging with European colonial expansion five hundred years ago, "extractivism is not limited to minerals or oil. Extractivism is also present in farming, forestry and even fishing" (Acosta, 2013: 62). Other authors have suggested extractivism doesn't stop there (Engels & Dietz, 2017). Once the extractivist mind frame has become established in a region it tends to spread and serve as a paradigm for economies and societies. These societies, and in particular certain places and regions, thus enter problematic and hard-to-abandon *extractivist trajectories*, a notion that resonates with the resource curse discourse.

Naomi Klein, in *This Changes Everything: Capitalism vs. the Climate* (2014), expanded the definition of extractivism to include social and relational dimensions:

> Extractivism is a nonreciprocal, dominance-based relationship with the earth, one purely of taking. It is the opposite of stewardship . . . the reduction of life into objects for the use of others, giving them no integrity or value of their own . . . It is also the reduction of human beings . . . into labor to be brutally extracted, pushed beyond limits.

She also argued that extractivism is "directly connected to the notion of sacrifice zones – places that, to their extractors, somehow don't count and therefore can be poisoned, drained, or otherwise destroyed" (Klein, 2014: 169).

In this book, we have chosen to make the *extractivist paradigm* a central feature. We do so partly because Arctic extractivism fits Acosta's definition well. Arctic resource extraction has removed low-processed natural resources out of the region for export, and it has expanded (in fact it was always) beyond minerals and oil into forestry, fishing, energy production, and nowadays also wind, solar, and hydro. Indeed, it has extended further into aquaculture, tourism, and other largely exogenous operations. We can also see disturbing elements of the Arctic serving as

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a "sacrifice zone," in Klein's language. Has the Arctic been a place that for its extractors somehow doesn't count? At the least, we can say, as we shall encounter further in this book, that Arctic resource extraction has often taken place without much care and concern for community and for the long-term.

So, we propose in this volume that the current Anthropocene world of unbroken multigenerational, geo-anthropological expansion of tapping resources from earth, soils, organic matter, landscapes, animals, knowledge, and human bodies functions under a paradigm that is at the same time physical, ideological, epistemic, and normative. It is a modus operandi that is especially hard to deal with since it also brings profit to the exploiters and wealth and sovereignty to states. Historically, it has until recently been considered largely virtuous, pragmatically useful, and underpinned by a comprehensive framework of legal and economic principles and institutions (Sörlin, 2021a).

Against this backdrop, the following question can be asked: Is Arctic extractivism sustainable – and will it continue in its current forms? If not, how might its future be different than its past?

Anthropocene: Overheating, Terraforming, Undermining

Humans are an extractive species; despite that still today not all members of humanity consume minerals or fossil energy in large quantities. As for CO_2 emissions, the richest 1 percent of the US population (3.5 million people) emit 318 ton per person/year, which is 200 times the average emissions of the poorest 50 percent of the world population, close to 4 billion people (Alvaredo, 2018). Nonetheless, billions of people in average- and high-income countries emit a lot and use materials in the thousands of consumer products that most average income people use and circulate.

Extraction of resources is not only what drives engines through fossil energy and economies through minerals and other precious resources. It is also the main driving force of the Anthropocene. Resource extraction and its multifarious ramifications make up a very large part of the geo-stratigraphic markers that are the criteria of the Anthropocene: the millions of kilometers of tunnels and pits that penetrate the planet, literally undermining it; the billions of tons of gravel and sand that terraforming humans removed and whose weight now trumps that of naturally eroding materials; the compounds that rest in the trillions of shots from firearms that are randomly leaking out to soils of battlefields and shooting ranges; the human fluvial and sedimentation processes all over the globe; and the emissions from industrial production, building, and heating (Zalasiewicz, Waters & Williams, 2014).

They also encompass the transportation and travel that the extracted resources are used for, be they pollutants or circulating toxic substances in rivers, lakes, and

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oceans, or airborne greenhouse gases driving climate change. Down the line in this world of "overheating" (Eriksen, 2016), glaciers and sea ice are melting, snow covers receding, seasons changing, species migrating, droughts intensifying, and fires and storms appearing more frequently, all adding to the stratigraphic signals (Zalasiewicz et al., 2019). Thus, there are a cascade of social consequences that stem from extractive economies, including unfair working practices, discrimination, and very uneven gender structures of local communities, alongside growth in wealth, although only fractions of it stay in the mining communities.

These changes and the quest for resources and access destabilize geopolitics and cast doubt over the impacts that the expansion of *capital*, rather than "humans" (*Anthropos*), wreak on the Earth system (Malm, 2016). An analysis of fifty-two peer reviewed articles on international relations (IR) in the Anthropocene literature suggested that one (of three) main discourses for "geo-political imagination" was "the extractivist world" (Lövbrand, Mobjörk & Söder, 2020). Such a world means continued expansion of resource extraction through mining, production of fossil fuels, rising global temperatures with their multiple disastrous effects (IPCC, 2021), rapid loss of global biodiversity (Dasgupta, 2021), sea floor ploughing, and deep sea mining (Childs, 2020). The starting date of the Anthropocene itself is debated, but since 2019, the Anthropocene Working Group, charged with reporting on the issue, officially favors "the base of the Anthropocene [to] be one of the stratigraphic signals around the mid-twentieth century of the Common Era."[2] The issue of dating the Anthropocene has become an insight-bringing academic industry in its own right (e.g., Swanson, 2016; Ellis, 2018; Lewis & Maslin, 2018), although a consensus has now built around a mid-twentieth century start.

Extraction on a large scale signifies human presence on the planet with terraforming projects on a scale visible to the human eye from the distance of satellites, such as the 260 square kilometers wide Mar de plástico ("Plastic sea") greenhouse in Andalucía, Spain. Or the largest open pit mining sites, such as Bingham Canyon Mine for extraction of copper in the Quirrh Mountains near Salt Lake City.[3] Multiple studies in recent years testify to the fact that extractivism, including prominently mining, is a major factor in the Anthropocene. In the film *Anthropocene: The Human Epoch*, accompanied by a book from the same team (Burtynsky, Baichwal & de Pencier, 2018), the large majority of cases concern resource extraction, from elephant tusks in Africa to potash mines in the Ural Mountains to lithium in Chile's Atacama desert to timber in Nigeria and British Columbia.

Examples abound from all continents. At Fourmile Creek catchment, Colorado, "mining impacts represent the dominant Anthropocene landscape change," exceeding pre-nineteenth-century rates by at least fifty times (Dethier et al.,

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2018). “Geoheritage sites” are increasingly identified all around the world to demonstrate the effects of humans on the geological scale, typically through mining and quarries (Margiotta & Sansò, 2017; Ruban, 2020). Even what has been called the “early Anthropocene,” Late Bronze Age to Early Iron Age, between 3,500 and 2,800 BCE, shows significant regional stratigraphic signals indicating an anthropogenic influence from mining and smelting in the Eastern Mediterranean, followed by excavation and burning of lead during the Roman period. In the iconography of the Anthropocene, the new earth forms are sometimes displayed as alluring aesthetics. Scaled down from the satellite to the rain forest or the Arctic shoreline, the open-pit mega-mines give many reasons for concern: pollution, contamination of groundwater from mining, devastating impacts on Indigenous and local communities (Demos, 2017) while at the same time providing employment, infrastructure, training opportunities, local multiplier effects, and resources and wealth for other communities, some far away.

Planetary Mining

Resource extraction is a key foundation of modern civilization as we know it, with consumption patterns, industrial production, huge material circulation, a massive increase of mobility, and more generally our present social and economic conditions. Resource extraction is directly linked to the massive growth of wealth and health improvements that, although they too are very unevenly distributed, have catapulted human population into a 500 percent increase since 1900 and have grown global GDP by 5,000 percent during the same period.[4] In addition, it has been suggested that democracy has only been feasible at the cost of compensation to voters through a share of the growth, hence bringing reasonable stability in otherwise turbulent and the heavily militarized twentieth and twenty-first centuries. This argument for “carbon democracy” (Mitchell, 2011) obviously has its counterpart in carbon dictatorships that remain numerous. Most of the latter are based on oil, requiring centralized infrastructures and predominantly based on export markets and with relatively small workforces that can be incentivized with good pay and fringe benefits, often fly-in-fly-out. Coal miners, and miners in general, on the contrary came in large numbers and were unionized but are also more likely to be sedentary and rooted in local communities. They have predominantly leaned to the left and been among the most militant labor groups, in Europe often Communist (Eley, 2002).

But the issue of resource extraction is in fact larger than that and has been growing even more with recent global production forms and geopolitics of climate and resources. There is now an acknowledged tension between majority

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democratic rule, extractive economic benefits, and long-term governance of the environment and climate for the common good (Di Paola & Jamieson, 2018). In Western countries, the fact that climate change requires urgent action is acknowledged mostly by the younger cohorts. The majority of those who are sixty-five and older are more complacent (Runciman, 2019). The prevailing extractivist paradigm does not make this tension any easier to deal with. Entire populations, not just workers in the fossil sector or elderly voters, are in some sense bribed or doped with the boosted wealth that extractivism also brings; Norway is a case in point (Norgaard, 2011; Anker, 2020). Increasingly, miners, especially coal miners, now lean toward populism and side with others, often other white men, in wanting the extractivist and fossil regime to stay, or at least its comfortable lifestyles and privileges, or indeed an entire extractivist social order not be abandoned – but in the case of coal mining it also plays an essential part in the energy mix, including in countries such as Poland, China, and India (Allen, 2021; Malm & the Zetkin Collective, 2021). Democracy under deep extractivism has profound challenges but also continues to generate opportunities in an array of places, and across geographical and social scales.

The recent rise of Arctic resource extractivism follows the ongoing reconfigurations of the global geography of mining. The mine, once a local site, a hole in the ground with a limited set of involved parties, has grown into a complex network of globalized relationships connecting banks and other networks of financial intermediation, mining machinery manufacturers, ports, ships, ocean trade corridors, and industries everywhere. These are what Martín Arboleda (2020) has called the "sprawling supply chains and complex infrastructures of connectivity" that have transformed the multiple local excavation sites into a "planetary mine" (Arboleda, 2020: 16–17; the concept originally from Labban, 2014) into which the individual mines fit, regardless of their physical location. These connectivities reach literally around the globe, increasingly defying the colonial geopolitics of previous centuries and instead fitting into the huge expansion of economies on all continents but in particular in East Asia. As Arboleda points out, the planetary mine is also "excavating the planetary," rather than just a set of single mining sites. The recently emerging form of globally integrated extractivism thus reaches beyond previous conceptualizations of globalization, such as "time-space compression" (Harvey, 1990), "spaces of flows" (Castells, 1989), or "liquid modernity" (Bauman, 2000). Emphasizing the material, the planetary mine metaphor rather reflects the growth of global extraction of anything from energy to soils, forests, oceans, animals, minerals – and humans, and how extraction is linked to climate and earth system crises as well as world trade and freedom of circulation, accelerating since the first decade of this century (Arboleda, 2020: 16–17).

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The Extractivist Paradigm

This is the new extractivist paradigm: the intervention into natural resources on the planetary scale and with an increasing decoupling between resource extraction and local community building – in combination with the expansion of the extractivist logic to more and more domains, including immaterial resources. To talk about *the planetary* rather than *the global* also suggests the socio-natural dimension of this phase of globalization, which we might more appropriately talk about as "planetization" (Connolly, 2017). By using the concept planetary we also underscore that planetary mining belongs in the same category as the Anthropocene, suggesting a distinct relationship between the geo-scale impacts of human resource extraction and the global sprawl of extractive industries with their similar impacts on social relations, the geographies of labor, and the vulnerabilities of local communities and Indigenous populations.

In this brief version of the emerging human–earth relationship and the planetarization of extraction it is perhaps not the facts themselves that are worth noticing. Many of them have circulated in scientific discourse, policy, and media over the last several years. By now, as we are well into the Agenda 2030 decade – to reach seventeen UN-declared Sustainable Development Goals, SDGs, by 2030 – they build a comprehensive factual and conceptual narrative with considerable implications for policy and what we may term a knowledge-informed contemporary *Weltanschauung* (Castree, 2021).

This includes the framing thoughts and narratives that have emerged to present them and to point out new directions for global governance. They already have their planetary toolbox for solutions invented, packed, and ready for curing the suffering patient: The comprehensive SDGs and a Paris climate accord to keep global temperatures well below 2 degrees Celsius, preferably below 1.5. A growing number of science-based planetary guardrails and boundaries (Rockström et al., 2009; Steffen et al., 2015). Most of these items of planetary or earth system governance (Biermann, 2014, 2020) are of fairly recent origin, as is the modern version of the idea of the Anthropocene itself (Crutzen & Stoermer, 2000; on earlier versions see Glacken, 1956; Mitman, 2018) – they all date from the last couple of decades. The important thing is rather to take them under a common view: The Anthropocene understanding of the human–earth relationship stands in a direct relationship to the changing geopolitics of natural resource extraction and the global networks of the "planetary mine."

The Arctic Extractivist Trajectory

The Arctic, a region of a mere four million inhabitants in a space five times the size of Europe, is now fully part of world affairs. In some respects, it arrived late,

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for reasons of limited access, uncertain economic feasibility but also active seclusion by the Arctic powers, especially during the Cold War. Natural resources were always at the center of external interest in the region. Resource speculation about northern lands and seas has a very long history (Sörlin, 1988, 2017; Zeller 1989/2009; Bruno, 2016), but for a long time first-hand accounts were few, travel was complicated, and demand was low. Still, elements of the Arctic extractivist trajectory started early with Europe taking the lead (Kruse, 2016). Mining in Iceland (sulphur) and Fennoscandia (iron) go back to the Middle Ages. Commercial whaling and sealing started in the North Atlantic in the seventeenth century and in Beringia in the nineteenth (Arlov, 2003; Demuth, 2019). Regional species extinctions followed, and in the twentieth and twenty-first centuries increasing numbers of Arctic species have been, and are, facing imminent extinction as a consequence of extraction, climate change, or other factors (Wolf, 2010), more than 400 in Canada alone (Canadian Encyclopedia, 2015).

Mining in Arctic North America dates to the sixteenth century, although a more pronounced expansion takes place only in the nineteenth and especially the twentieth, when it is accompanied by a growth in oil and gas extraction (Haycox, 2002; Coates & Morrison, 2005; Piper, 2009; Keeling & Sandlos, 2015; Coates, 2018). A similar pattern of late but dramatic expansion takes place in Russia and the Soviet Union (Josephson, 2011, 2014; Högselius, 2012; Bruno, 2016). In Greenland, mining began in the middle of the 1800s (graphite, later gold, cryolite; Sejersen, 2015), and in Svalbard the first coal extraction started around 1900 and then expanded quickly, first with several states engaged but after some time with Norway, the USSR, and later Russia as the main players (Arlov, 2003; Avango, 2005; Avango, Hacquebord & Wråkberg, 2014; Kruse, 2016). Some of that extractive activity has now ceased, while some of it has been re-started in recent years.

In the extractive rushes that followed many of the resource discoveries, Indigenous people and northern settlers found work at the margins of the mining economy, some of it tied up with militarization and securitization. Effects were mixed but often negative. Typically, Indigenous land-based economies were eroded, and communities were ravaged by introduced diseases and their traditional livelihoods were disrupted. From the turn of the millennium 2000, a more than decade-long global "commodities super cycle" drove resource extraction even further with an already existing prospect of increased direct sea routes between expanding Asian economies and Arctic basin minerals and fossil fuels. Arctic Indigenous populations, like Indigenous populations elsewhere, are split in their positions on mineral and fossil fuel resource extraction. Nonetheless, concerns are deep over extraction practices and their low ethical standards and over the

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long-term impacts on Indigenous communities (Lertzman & Vredenburg, 2005; Anaya, 2013; Wilson & Stammler, 2016). The acknowledgment of losses of independence, agency, rights, and ownership and control of lands and resources has led to questions of redress and compensation. Can losses and "scars" (Storm, 2014) in the past be acknowledged so they could "heal" in the future (Tsosie, 2007)? Could consultation and revenue-sharing (Nuttall, 2017) be a way to continue extraction and at the same time build community? This will be another theme of crucial importance for the current volume: the ethical and cultural-emotional dimensions of extractivism.

Each of these histories is important, moving, and rich in detail, and there will be many instances in this volume where we will encounter individual features of them, because they are also often profoundly different, linked as they are to legal frameworks and economic structures firmly set by national conditions in the past and the present over the huge circumpolar space. In particular, this is true of the five Arctic coastal states – Norway, Denmark, Russia, Canada, and the United States – where boundary zones, such as the Bering Strait, often brutally underscore the national differences (Dadykina et al., 2017; Demuth, 2019). From the Early Modern period we find many other nations also tapping into northern resources (Netherlands, Great Britain, Spain, Portugal, and Japan), particularly in marine resources that were more accessible and required less geopolitical muscle, especially around the disputed territory of Spitsbergen and the high North Atlantic (Bravo, 2006; Avango et al., 2014).

Long distance engagement happened to a smaller extent in terrestrial mining, but was still considerable. Swedish geo-entrepreneurs and British mining companies were active in Spitsbergen/Svalbard mining at an early stage, supported in Sweden by scientists who shaped the politics of prospecting (Wråkberg, 1999; Jones, 2008; Avango et al., 2014, p. 23), and fueled in Britain by a "myth of superabundance" (Macadam, 2011, chapter 4), especially of coal (Avango et al., 2011; Kruse 2016). More recently, China has entered into mining projects in Greenland and renewable energy production in Iceland. India, Korea, Japan, and some EU member states claim they can contribute with technology, logistics, transport, and industrial wherewithal as resources in the region are becoming more accessible (Hara & Coates, 2014). In this ambition, they make active use of history and precedent, claiming past Arctic presence through research or historical mining or whaling (Paglia, 2018). Deregulation has made prospecting a global market, and transnational companies, often based in Canada and Australia, operate on multiple sites across the polar cap, except in Russia, which upholds its resource nationalism on oil, gas, and minerals stringently (Baev, 2008; Koch & Perrault, 2019). Russia is also very active in Arctic marine extractivism, as is Norway (Dale, Bay-Larsen, & Skorstad, 2018) (Figure 1.1).

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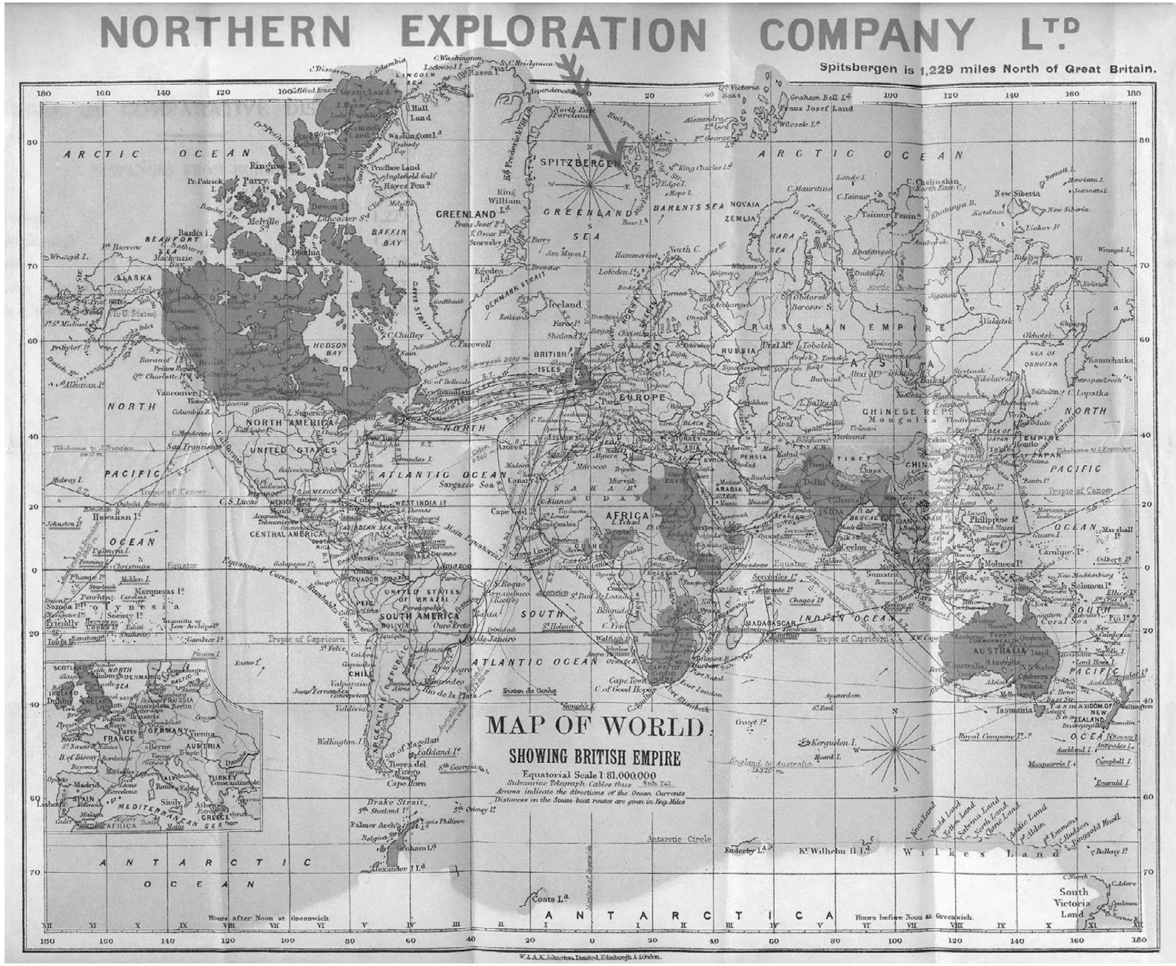

Figure 1.1 Map produced by the Northern Exploration Company during the First World War, indicating the firm's ambition to integrate Spitsbergen into the British Empire. Source: Coal and iron in Spitsbergen (1918) Pam (*32): 622.333, Scott Polar Research Institute Library, Cambridge. Reproduced with permission.

Arctic Hyper-Extractivism

These variations across time and space are important and will be highlighted in the chapters of this book. However, it is essential to observe that there is at the same time a common pattern for the entire region, namely the dependence of its extractive industries on developments elsewhere, around the entire world, for capital, regulation, often labor, and above all demand and markets. This underscores how well these industries align with Acosta's articulation and how well they fit the overarching Anthropocene extractivist paradigm. Arctic extractivism, its emergence, and especially its recent growth, post-1989 – both real and anticipated, sometimes hyped – are synchronized with the expansion of globalizing industrial capitalism and its institutions, and especially with its recent acceleration and with resource extraction extending to, and integrated with, the aforementioned "planetary mine."

Its geophysical and environmental impacts in the Arctic itself follow the general pattern of the Anthropocene elsewhere (ACIA, 2004; Lenton, 2012; Carson & Peterson, 2016). External demand motivates this rush for resources, and markets and consumption elsewhere swing the Arctic into its *hyper-extractivist* role on the world scene, figuring, once again, largely as a resource frontier, boosted by coastal states and large geopolitical actors such as China. The Arctic is in this respect part of a much bigger whole. But it is a significant part because its properties of being rich in a plurality of extractive resources – from marine mammals to strategic minerals to fossil fuels – are extreme by most standards, especially if resource density is compared to demography and presence of cities and agriculture. The Arctic is sparse in population and vulnerable to climate change, trebling global average temperature rise, and rapidly losing summer sea ice (NSIDC, 2020). This makes Arctic global processes *hyper-visible* and the Arctic itself into a looking glass through which the workings of the contemporary world can be seen and, vice versa, a looking glass for the world to see extractivism in an oversize version. The Arctic Anthropocene may be small in numbers, but it is big in scale, impact, and as a specter (Figure 1.2).

Is Arctic extraction sustainable? As the world is looking for a transformation away from fossil fuels and toward a more strategic position vis à vis minerals, this question must be asked more critically and profoundly than before. At any rate, the extractivist paradigm is in change and, at least potentially, in a critical state. The Arctic is therefore a key place in a key moment to study global resource extraction. The world is destined to undergo a deep transition from a fossil fuel-based economy to something that may turn out to be a paradigmatically different phase of world history (McNeill & Engelke, 2014). The transition will have an impact on most extractive industries, although in different ways that we do not yet know.

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Figure 1.2. Mining in the High Arctic: The Diavik diamond mine in Canada's Northwest Territories, approximately 300 kilometers northeast of Yellowknife and 220 kilometers south of the Arctic Circle. www.gia.edu/gems-gemology/summer-2016-diamonds-canadian-arctic-diavik-mine. Photo: courtesy of Diavik Diamond Mine. Photo reproduced from James E. Shigley et al., Mining Diamonds in the Canadian Arctic. Gems & Gemology, Summer 2016, 52 (2), www.gia.edu/gems-gemology/summer-2016-diamonds-canadian-arctic-diavik-mine

Some industries will likely benefit from the change – wind and solar power, strategic minerals. Others will likely suffer as coal does already in many parts of the world, and oil probably will in the not too distant future. Greenland, an area larger than Europe, with very large potential resources (USGS, 2008) has already announced it will no longer allow oil prospecting, and in 2021 a national election pivoted around the issue of mining (McGwin, 2021). Indigenous economies, based on fishing, herding, hunting, and tourism, face an uncertain future. With the transformation come not only economic change, political upheavals, or sustainability challenges but also concerns about social justice as global needs grow and renewable energy projects end up interfering with Indigenous rights to herd, while carbon and other natural resource footprints remain grossly unequal and widening (Alvaredo, 2018).

Extractivism and the Anthropocene complement each other in a lock step fashion. The latter is largely defined by the *impact* of mankind on the geological scale and defined by stratigraphic traces of a certain magnitude and persistence. The extractivist paradigm, on the other hand, can be defined as the generic practice

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and the economic and ideological legitimation for the processes that actually *create and reinforce* the Anthropocene impact. The extractivist paradigm draws the focus toward the agential dimensions of the Anthropocene and not just its quantified impacts and consequences, such as the transgression of planetary boundaries or the wounds that extractivist activities left on the planet. It brings to the fore the need to recognize the cumulative impact and the consequences for those at the frontline.

So, the frame here is that extraction is an overarching driver of the Anthropocene, which also means that it is the parts of humanity that have been part of extractivism that are rising to become of particular interest, as the hotspots of global change. The agency of extractivism, both through demand and consumption, on the one hand, and through capital and much of the physical extraction labor has come from particular strata of the world, and only to a limited extent from inside the region. This has been a persistent pattern for centuries. Extractive industries thus carry a lot of responsibility for a particular view of the world as an object of extraction and the extension of this activity to include not just minerals and energy but also the various geo-spherical elements such as the biosphere, the atmosphere, the lithosphere, the cryosphere, and the hydrosphere. The technosphere (Haff, 2014) performs the work required, and it too now extends to the Arctic, making its previous exceptionalism less exceptional.

A Window of Opportunity?

This may seem all gloomy and with little prospect for hopeful change. If we raise our sights, however, we can also see that many social and political forces around the world wish to temper and indeed rework the operating space for *the extractive world order*. Achieving this is implied in the UN SDGs and the Paris accord, although with many gestures of loyalty to those nations and companies that remain deeply trapped in the quagmire of resource path dependency.[5] It is not unrealistic to argue that we are in a moment of world history, and in the evolution of the extractivist paradigm, when new futures should be seriously considered. The Anthropocene moment, reinforced by the experiences gained in battling the Covid-19 pandemic, can be seen as a window of opportunity to rethink human relationships with everything of which we as humans are part.

The expansion into “virgin lands” – typically already populated – has been part of the nationalist territorial projects of many nations, not least precisely those that now occupy the Arctic rim. There is an extractive hinterland history to them all: empires and settler colonies such as Canada, Denmark, Russia, and the United States; and their latter day independent former colonies or subordinate territories such as Alaska, Norway, Finland, Iceland, and Greenland, which is still only partially independent. The majority of these countries and regions have based

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much of their identity on techno-agro-economic expansion into presumably empty and at least available territory – the opening of the West (USA) and of the East (Russia); there were frontier lands to be conquered and domesticated. Sweden and Norway had their directions north (terrestrial and marine, respectively), Denmark too. The north became the calling and the national anthem of Canada (Grace, 2002). Both Russia, with the Northern Sea Route and its extractivist bonanza that started in the Soviet period, and the United States, with Alaska's forests, gold, and Northern slope oil, shared in the northern quest. The Arctic is a very special and persistent case of "resource colonialism" (Avango, Högselius, & Nilsson, 2018), partly internal, partly external. It is also subject to angry criticism from some Indigenous groups that "green colonialism" (Fjellheim & Florian, 2020) is used to promote new forms of extraction, such as wind and solar energy, that, if beneficial in other ways, tend to disregard cultural and social impacts.

The shrunken, vulnerable, and overheating planet we have increasingly found we are trapped on is quickly becoming a very different place than the one for which modernity's imperial-extractivist imaginaries were once constructed and where they were central to ideas of civilizational progress and wealth. This understanding will have profound consequences for the way we think about the Arctic and extractivism, not just in academia. Perhaps this is especially true for the humanities and social sciences. The planetary has indeed become a "humanist category" (Chakrabarty, 2019) fitting the Anthropocene trope. The contours of a corresponding "Arctic humanities" (Sörlin, 2015; Dodds & Sörlin, 2022) can also be glimpsed on the horizon. Increasingly, and to a large degree in this volume, the Arctic is also seen as a humanist category. In it, words such as value, ideas, culture, anticipation, power, politics, will, greed, emotion, heritage, fate, and future play major roles, alongside the geological and economic dimensions of extraction. It should be highly relevant for the study of resource extractivism, which is only in one aspect a physical undertaking. It is not even only human. We are talking about an inclusive more-than-human and more-than-social way of looking at resource extraction, which is expanding from its previous domains of engineering, geology, and resource economics to the wider issues of societal transformation to address major human–earth challenges. This calls for a broader and deeper agenda of analysis where no field of knowledge must be excluded.

This volume speaks to critical policy dilemmas linked to resource extraction and extractive industries in the Arctic in a context that is global. The Arctic Ocean, although the smallest of the global oceans, is a major factor in the global climate system. The Arctic holds massive energy and mineral resources, the details of which are not known, although according to data by the United States Geological Survey, it amounts to a very large undiscovered potential of the oil and gas reserves of the world, in the order of 25 percent (USGS, 2008). It also has a

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significant share of strategic and rare earth minerals, some with a long history of regional extraction (Morse, 2003; Nielsen & Knudsen, 2013; Bjørst, 2016; Vikström & Högselius, 2017; Vikström, 2020). This large presence of extractivism occurs in a region of only four million inhabitants, where there are many dozen first nations and possibly as many as ninety Indigenous languages spoken, plus several national and settler languages (Arctic Council, 2021). Largely inaccessible to non-residents in the past, the region is now within reach through airports and sea routes. Tourism with roots in the nineteenth century has been a growing source of income, particularly post-1989 when the Cold War ended and the region started opening up.

Arctic communities, many Indigenous, others ethnically diverse, are unique and irreplaceable. They are rich in traditions, some of them with roots dating back thousands of years. Their livelihoods are dependent on functional ecosystems and traditional ways of life just as much as they represent modern life forms and are embedded in the extractivist technologies and economies.

As global economies and geopolitics shift, resources of the Arctic have become ever more attractive to both Arctic states and international investors and consumers. Their extraction is a prime interest for Arctic states, for non-Arctic states with strategic and economic stakes in the region, and for the Arctic communities themselves that in some cases benefit from extraction but in other cases are negatively affected. Indeed, in some cases non-extraction is a strong interest, or an extraction that at the very least has the sustainability of Arctic communities as a firsthand goal. How extraction is conceived makes a big difference, as does where it occurs.

In the warming post-Cold War situation, it was for a time commonplace to see a new resource frontier take shape with typical boosterism. However, development has been slower than expected, which should remind us that current processes need to be read against the background of a long extractivist history, with cycles of extraction, export, and degradation. These cycles hardwired Arctic resource extraction to a physical geography of infrastructures, ports, airports, pipelines, roads, and railways but also to urban centers with modern communication/digital networks in some parts of the Arctic, predominantly outside the region where capital, expertise, and political wherewithal exist, arguably creating a "path dependency" toward resource extraction and cementing a peripheral role for the Arctic in the global economy (Bennett, 2016).

Can Path Dependencies Be Broken? Aims and Themes

This volume aims to establish and explain the complex and intricate policy and public dilemmas that arise from this situation. Its first and foremost aim is to *make*

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the situation legible and lay out the dilemmas and difficulties that resource extraction and geopolitics face in the region in our present time. This work will be undertaken against a backdrop of substantially growing knowledge about the Arctic over the past few decades, a large part of it from the social sciences and humanities. We have learned a great deal from research across all knowledge fields about security and international relations; about social change in the Arctic, legal frameworks, ecosystems, and climate change; and about the history of the region, politically, ethnically, culturally, economically, linguistically, and environmentally. We also know much more about how the present Arctic emerged as an integrative part of a planet under considerable stress and with actors at all levels constantly adapting to changing geopolitical framings and pressures. We are already well into the fourth decade since Glasnost was announced and more than thirty years have passed since 1989 – and now we face a revanchist Russia seeking to restore its great power status.

The volume's second aim, therefore, is to provide a more *nuanced understanding of the current Arctic as an integrative region in an extractivist planetary mine*. It is an understanding that must take a distance (Wormbs, 2018) to several rosy "Arctic futures" as they were presented in the recent past (e.g., Emmerson, 2010; Smith, 2011). The "new" Arctic we see may be more accessible and "modern," and regarded as an object of investment, initiative, and of tension and conflict (Evengård, Larsen, & Paasche, 2015). Nonetheless, it comes across as a region with considerable challenges. Inequalities are wide and growing. Governments, which have widely adopted Arctic strategies for resource development, security, and governance since the end of the Cold War nevertheless lack appropriate strategies for managing human and social development. Long-term views are rare, and sustainability, although frequently called upon in strategy rhetoric, is far from likely, especially if extractivism is going to expand further on its current unsustainable course (Fondahl & Wilson, 2017; Sörlin, 2021b).

Its third aim is to *critically examine resource extraction*. In a period of uncertain global and regional geopolitics, Arctic states remain highly dependent on resource extraction. What is the future of a region that lives off minerals and fossil fuels, and had hoped to expand their role in global and national economies, if and when these doors are closing? The question is relevant. The current situation is that the Arctic is already undergoing profound transformations. Traditional resource extraction projects have been in some cases put on hold or stalled because of concerns over costs and ownership. New kinds of extractive futures are suggested, with tourism and research as central features of the new extractive paradigm. On the other hand, the Arctic coastal states are taking their oil drilling and other extractivist ventures further north – Norway being a pioneer in this regard.

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In doing so they face growing resistance and friction both on old and new fronts. The Biden administration in the United States has already rolled back oil-drilling, forest clearing, and road building permits that Donald Trump gave in Alaska (NYT, 2021; Washington Post, 2021). Activists and local communities protest extractivist projects across the circumpolar Arctic. Even some banks are now refusing to fund investment in northern projects.

The Norwegian government was taken to court again in 2021, this time by climate activists backed by Greenpeace to the European Court of Human Rights (ECHR), for its extraction of oil in Arctic waters (Reuters, 2021). Around the world, legal interventions against extractivism, especially climate related, are growing rapidly (Ebbesson, 2020–2021; Walker-Crawford, 2020). Legal experts are contemplating the concept of "ecocide," championed by Olof Palme in his opening speech at the UN conference on the human environment in Stockholm 1972 and pioneered by Scottish barrister Polly Higgins (2011; Higgins, Short, & South, 2013), as an addition to the Rome Statute and in continuation of the conceptual innovations from the twentieth century: crime against humanity (Hersch Lauterpacht) and Genocide (Raphaël Lemkin) (Sands, 2016; Main-Klingst, 2021). Around the world, we see how rivers and other ecosystems are attributed legal personality.

Exploring *how to reframe and re-purpose extraction*, and out-phase and terminate certain forms of it, is a fourth aim of this book and one of which there is already considerable experience. Norwegian philosopher Arne Naess took a pioneering interdisciplinary team of thinkers and academics to Svalbard in the middle of the 1990s and proposed that the future of the region was no longer coal or mining but tourism and science. He also supported dog sledding tourism (Buzza, 1994). A quarter century later his initiative seems timely, even far sighted, as transitions are now happening that lead away from coal extraction (Paglia, 2020). On the other hand, new extractivism is also happening, perhaps at an even higher rate on Svalbard and elsewhere. We will look into cases where this has already happened, with varying degrees of success, and by and for whom, and we will consider the potential and politics of future projects aimed at re-purposing-mines.

Will these changes be in line with the transformations required to bring down CO_2 emissions, reach SDG goals, and comply with the Agenda 2030? Could the compass turn 180 degrees and the European Arctic become a vanguard of fossil free and sustainable mining? These are intriguing questions and interesting prospects. On the other hand, the growing geopolitical tension and raised security stakes in the region which are reminders of the Cold War position of the Arctic as a potential theatre of the Third World War (Doel, 2003; Farish, 2010), unfortunately make it less likely.

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The Book: A Brief Outline

This book arrives during a time of uncertainty in the world and in the Arctic. Transformations are on the agenda, but inertia still reigns. What we offer in the following four sections and twelve chapters are ideas, insights, and knowledge from many years of research into Arctic resource extractivism spurred and ignited by recent developments.

In Part I the ambition is first of all to set the stage and present the long history of resource extraction in the circumpolar north, especially mining. While acknowledging tremendous diversity, across time and between different parts of the vast region there are also some similarities. First of all, the strong presence of Arctic extractivism has exerted path dependency on most actors in and outside of the region (Sörlin et al., 2023, see Chapter 2). At the same time, this helps explain the vulnerability of modern Arctic communities and the lack of fundamental reorientation into a post-extractivist mode. Where such ambitions have started, as for example in the transnational, but Norway-administered, island region of Svalbard, the irony is that the new sources of income that are replacing it – long distance tourism, science, and onsite scientific education – tend to reproduce "extractive" patterns, reinforcing the sense of path dependency (Sokolíčková & Eriksen, 2023, see Chapter 3).

Part II explores more thoroughly the details and mechanisms whereby the extractive logic and the path dependency play out in reality. This is demonstrated through case studies of areas in the Nordic countries – Arctic Fennoscandia – where Sámi reindeer herding is under increasing pressure from an ever-growing range of resource extraction. It comprises minerals, large-scale forestry, hydropower, and wind power but also tourism, and most recently the cold climate, which has spurred the location by tech-giants of server halls and also spurred massive investment in electricity-demanding battery factories and fossil-free steel production. The "multiple pressures" brought by these extractive activities taken together are typically disregarded in impact assessments that were not designed to evaluate complex issues about the future of cultures and livelihoods but only the legal status of a particular project. Ironically, even the mechanisms for influence by the Sámi, such as frequent consultation meetings, add to the burden that along with climate and environmental change risks Indigenous and regional sustainability (Österlin et al., 2023, see Chapter 5; Rosqvist et al., 2023, see Chapter 6). Efforts have been tried, however, for example scenario workshops with popular participation (Nilsson & Sarkki, 2023, see Chapter 4) to remedy problematic trends and identify both risks and opportunities.

Part III deepens the analysis of how consultative decision-making on resource extraction takes place with an emphasis on cultural and emotional registers.

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The reader is sitting in on a contemporary, online negotiation process engaging international mining and prospecting companies, local inhabitants and stakeholders, and the Greenlandic government. This multi-site ethnography, about a proposed extraction site in southern Greenland, demonstrates the complex forces of the powerplay in a game of deep uncertainties, opposing interests, and, not least, the strong impression that these things combined build an unnerving tension and obvious lack of fairness into the putatively democratic and participatory process (Bjørst, Sejersen, & Thisted, 2023, see Chapter 7). Yet another layer of meaning-making is offered by an analysis of the rich underground lore and artistic expression. Officially, northern resources have always been associated with hopes of wealth and progress. In reality, though, both the far North and the subterranean world are mysterious and enchanted mindscapes. Such beyond-the-rational affective potential can help explain both excitement and controversies around underworld extraction (Herva, Komu, & Paphitis, 2023, see Chapter 8).

Part IV brings the trajectory through to the tail end of extraction. Here we encounter abandoned mines and mines that are being re-purposed, either during the extraction phase or after it. In-depth case studies are presented from Canada, Svalbard, Norway, Finland, and Sweden. Some of the abandonment processes stand out as harsh and uncompromising, whereas others come across as more benign and genuinely transformative and caring for the community. What the chapters in this section (Flyen et al., 2023, see Chapter 9; Avango et al., 2023, see Chapter 10; Malmgren et al. 2023, see Chapter 11) demonstrate is how lowly regarded these processes of closing and re-purposing have been in the past. With the transformation of economies toward tourism and heritage, these are now becoming more valued by community members and national governments. This goes hand in hand with a less universal appreciation of new mining projects across not just Indigenous but also other residential communities. Old mines can take on new significance.

Finally, in Part V, the extraction trajectory is taken another step further. Is there a future "beyond mining" and what would it look like (Lien, 2023, see Chapter 12)? It is hard to conceive in a region that has since time immemorial lived off resources and in periods really thrived. It is also hard to align with the juggernaut expansion of the "planetary mine" to every corner of the planet. Path dependencies remain powerful (Sörlin, 2023, see Chapter 13). Still, questions about a potential post-extractivism belong in a book about the paradigm of extractivism. They are raised probingly and with an open mind. In the words of Naomi Klein (2014: 169): "Even such traditionally destructive practices as logging can be done responsibly, as can small-scale mining, particularly when the activities are controlled by the people who live where the extraction is taking place and who have a stake in the ongoing health and productivity of the land."

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Notes

1 Historical data on metal production provided by https://ourworldindata.org/grapher/metal-production-long-term gives similar results, with a somewhat less pronounced growth for copper. They use as sources the Clio Infra project hosted by the International Institute of Social History (IISH) in Amsterdam,www.clio-infra.eu/, and the US Geological Survey, https://minerals.usgs.gov/minerals/pubs/commodity/

2 The Anthropocene Working Group, a subcommission of the International Commission of Stratigraphy, suggests the following as examples of what could constitute the Anthropocene in contrast to the Holocene:

> An order-of-magnitude increase in erosion and sediment transport associated with urbanization and agriculture; marked and abrupt anthropogenic perturbations of the cycles of elements such as carbon, nitrogen, phosphorus and various metals together with new chemical compounds; environmental changes generated by these perturbations, including global warming, sea-level rise, ocean acidification and spreading oceanic 'dead zones'; rapid changes in the biosphere both on land and in the sea, as a result of habitat loss, predation, explosion of domestic animal populations and species invasions; and the proliferation and global dispersion of many new 'minerals' and 'rocks' including concrete, fly ash and plastics, and the myriad 'technofossils' produced from these and other materials.

http://quaternary.stratigraphy.org/working-groups/anthropocene/

3 https://en.wikipedia.org/wiki/Artificial_structures_visible_from_space.

4 https://ourworldindata.org/grapher/world-gdp-over-the-last-two-millennia

5 It has been pointed out that the 6th Assessment Report from the IPCC (2021) in its *Summary for Policymakers* made no reference whatsoever to fossil fuels as causes of anthropogenic climate change. "You'll find out *what's* happening to the climate, but you won't find out *why* it's happening or *who* is responsible. It's all just 'Humans,' 'emissions,' 'activities,' and 'influence'." Atkin (2021)

References

ACIA. (2004). *Arctic Climate Impact Assessment*. Cambridge: Cambridge University Press.

Acosta, A. (2013). Extractivism and neoextractivism: Two sides of the same curse. In M. Lang and D. Mokrani, eds., *Beyond Development: Alternative Visions from Latin America*. Quito: Fundación Rosa Luxemburg, pp. 61–86.

Acosta, A. (2020). Extractivism. In E. Vivares, ed., *The Routledge Handbook to Global Political Economy Conversations and Inquiries*. London: Routledge, chapter 23 (17 pp.).

Allen, I. (2021). *Dirty Coal: Industrial Populism as Purification in Poland's Mining Heartland*. Stockholm: KTH Royal Institute of Technology.

Alvaredo, F. (2018). *The World Inequality Report*. Cambridge, MA, and London: Harvard University Press.

Anaya, J. (2013). *Report of the Special Rapporteur on the Rights of Indigenous Peoples, Extractive Industries and Indigenous Peoples*. United Nations online report, A/HRC/24/41. www.ohchr.org

Anker, P. (2020). *The Power of the Periphery: How Norway Became an Environmental Pioneer for the World*. Cambridge: Cambridge University Press.

Arboleda, M. (2020). *Planetary Mine: Territories of Extraction under Late Capitalism*. London and New York: Verso.

Arctic Council. (2021). Arctic Indigenous Languages. Indigenous People's Secretariat website. www.arcticpeoples.com/arctic-languages

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Arlov, T. B. (2003). *Svalbards historie*. Oslo: Tapir Akademisk Forlag.
Atkin, E. (2021). Heated. Blogpost. https://heated.world/p/i-dont-like-ipcc-report-day
Avango, D. (2005). *Sveagruvan: Svensk gruvhantering mellan industri, diplomati och geovetenskap 1910–1934*. Stockholm: Jernkontoret.
Avango, D., Hacquebord, L., and Wråkberg, U. (2014). Industrial extraction of Arctic natural resources since the sixteenth century: Technoscience and geo-economics in the history of northern whaling and mining. *Journal of Historical Geography*, 44, 15–30. https://doi.org/10.1016/j.jhg.2014.01.001
Avango, D., Högselius, P., and Nilsson, D. (2018). Swedish explorers, in-situ knowledge, and resource-based business in the Age of Empire. *Scandinavian Journal of History*, 43(3), 324–347. https://doi.org/10.1080/03468755.2017.1380923
Avango, D., Hacquebord, L., Aalders, Y., De Haas, H., Gustafsson, U., and Kruse, F. (2011). Between markets and geo-politics: Natural resource exploitation on Spitsbergen from 1600 to the present day. *Polar Record*, 47(1), 29–39. https://doi.org/10.1017/S0032247410000069
Avango, D., Lépy, É., Brännström, M., Heikkinen, H.I., Komu, T., Pashkevich, A., and Österlin, C. (2023). Heritage for the future: Narrating abandoned mining sites. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Baev, P. K. (2008). *Russian Energy Policy and Military Power: Putin's Quest for Greatness*. London: Routledge.
Bauman, Z. (2000). *Liquid Modernity*. Cambridge: Polity.
Bebber, M. R., Key, A. J. M., Fisch, M., Meindl, R. S., and Eren, M. I. (2019). The exceptional abandonment of metal tools by North American hunter-gatherers, 3000 B.P. *Scientific Reports*, 9, 5756. https://doi.org/10.1038/s41598–019-42185-y
Bennett, M. M. (2016). Discursive, material, vertical, and extensive dimensions of post-Cold War Arctic resource extraction. *Polar Geography*, 39(4), 258–273. https://doi.org/10.1080/1088937X.2016.1234517
Biermann, F. (2014). *Earth System Governance: World Politics in the Anthropocene*. Cambridge, MA: MIT Press.
Biermann, F. (2020). *Architectures of Earth System Governance*. Cambridge: Cambridge University Press.
Bjørst, L. R. (2016). Saving or destroying the local community? Conflicting spatial storylines in the Greenlandic debate on uranium. *The Extractive Industries and Society*, 3(1), 34–40. https://doi.org/10.1016/j.exis.2015.11.006
Bjørst L. R., Sejersen, F., and Thisted, K. (2023). Affective approaches: Rethinking emotions in resource extraction. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Bravo, M. T. (2006). Geographies of exploration and improvement: William Scoresby and Arctic whaling, 1782–1822. *Journal of Historical Geography*, 32(3), 512–538. https://doi.org/10.1016/j.jhg.2005.10.006
Bridge, G. (2009). Material worlds: Natural resources, resource geography and the material economy. *Geography Compass*, 3(3), 1217–1244. https://doi.org/10.1111/j.1749-8198.2009.00233.x
Brockington, D., Duffy, R., and Igoe, J. (2008). *Nature Unbound: Conservation, Capitalism and the Future of Protected Areas*. London: Earthscan.
Brown, T. J., Idoine, N., Wrighton, C. E., Raycraft, E. R., Hobbs, S. F., Shaw, R. A., Everett, P., Deady, E. A., and Kresse, C. (2021). *World Mineral Production 2015–19*.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Keyworth, Nottingham: British Geological Survey. www2.bgs.ac.uk/mineralsuk/download/world_statistics/2010s/WMP_2015_2019.pdf

Bruno, A. R. (2016). *The Nature of Soviet Power: An Arctic Environmental History*. Cambridge: Cambridge University Press.

Burtynsky, E., Baichwal, J., and De Pencier, N. (2018). *Anthropocene.* Toronto: Art Gallery of Ontario; Fredericton, New Brunswick: Goose Lane Editions.

Buzza, R. (1994). *Hvit villmark: Om en ferd i Svalbards natur og menneskets sinn. With an introduction by professor Arne Næss*. Oslo: Grøndahl Dreyer.

Canadian Encyclopedia. (2015). Endangered Arctic Animals. *Online Encyclopedia.* www.thecanadianencyclopedia.ca/en/article/arctic-animals-editorial

Carson, M. and Peterson, G., eds. (2016). *Arctic Resilience Report*. Stockholm: Arctic Council, Stockholm Environment Institute and Stockholm Resilience Centre. www.arctic-council.org/arr.

Castells, M. (1989). *The Informational City: Information Technology, Economic Restructuring, and the Urban Regional Process*. Oxford: Blackwell.

Castree, N. (2021). Framing, deframing and reframing the Anthropocene. *Ambio*, 50(10), 1788–1792. https://doi.org/10.1007/s13280–020-01437-2

Chakrabarty, D. (2019). The planet: An emergent humanist category. *Critical Inquiry*, 46 (1), 1–31. https://doi.org/10.1086/705298

Childs, J. (2020). Extraction in four dimensions: Time, space and the emerging geo(-) politics of deep-sea mining. *Geopolitics*, 25(1), 189–213. https://doi.org/10.1080/14650045.2018.1465041

Coates, K. (2018). The history and historiography of natural resource development in the Arctic: The state of the literature. In C. Southcott, F. Abele, D., Natcher, and B. Parlee, eds., *Resources and Sustainable Development in the Arctic*. London: Routledge, 23–41.

Coates, K. and Morrison, W. (2005). *Land of the Midnight Sun: A History of the Yukon*. Montreal and Kingston: McGill-Queen's University Press.

Connolly, W. (2017). *Facing the Planetary: Entangled Humanism and the Politics of Swarming*. Durham, NC: Duke University Press.

Crawford, K. (2021). *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. New Haven, CT: Yale University Press.

Crutzen, P. W. and Stoermer, E. (2000). The Anthropocene. *Global Change Newsletter*, 41, 17–18.

Dadykina, M., Kraikovski A., and Lajus, J. (2017). Mastering the Arctic marine environment: Organizational practices of Pomor hunting expeditions to Svalbard (Spitsbergen) in the eighteenth century. *Acta Borealia*, 34, 50–69. https://doi.org/10.1080/08003831.2017.1322265

Dale, B., Bay-Larsen, I., and Skorstad, B., eds. (2018). *The Will to Drill: Mining in Arctic Communities*. Cham: Springer International Publishing.

Dasgupta, P. (2021). *The Economics of Biodiversity: The Dasgupta Review*. London: HM Treasury.

Dearne, M. J. and Branigan, K. (1995). The use of coal in Roman Britain. *The Antiquaries Journal*, 75, 71–105.

Demos, T. J. (2017). *Against the Anthropocene: Visual Culture and Environment Today*. Cambridge, MA: MIT Press.

Demuth, B. (2019). *Floating Coast: An Environmental History of the Bering Strait*. New York: Norton.

Dethier, D. P., Ouimet, W. B., Murphy, S. F., Kotikian, M., Wicherski, W., and Samuels, R. M. (2018). Anthropocene landscape change and the legacy of nineteenth- and

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

twentieth-century mining in the Fourmile Catchment, Colorado Front Range. *Annals of the American Association of Geographers*, 108(4), 917–937. https://doi.org/10.1080/24694452.2017.1406329

Di Paola, M. and Jamieson, D. (2018). Climate change and the challenges to democracy. *University of Miami Law Review*, 72(5), 369–423. https://repository.law.miami.edu/umlr/vol72/iss2/5pp. 3-9

Dodds, K. and Sörlin, S. (2022). *Ice Humanities: Living, Thinking and Working in a Melting World*. Manchester: Manchester University Press.

Doel, R. E. (2003). Constituting the postwar earth sciences: The military's influence on the environmental sciences in the USA after 1945. *Social Studies of Science*, 33(5), 635–666. https://doi.org/10.1177/0306312703335002

Ebbesson, J. (2020/2021). Klimatprocesser mot staten – runt om i världen och i Sverige. *Juridisk Tidskrift*, 32(1), 106–129.

Eley, G. (2002). *Forging Democracy: The History of the Left in Europe, 1850–2000*. Oxford: Oxford University Press.

Ellis, E. C. (2018). *Anthropocene: A Very Short Introduction*. Oxford: Oxford University Press.

Emmerson, C. (2010). *The Future History of the Arctic: How Climate, Resources and Geopolitics are Reshaping the North, and Why it Matters to the World*. New York: Public Affairs.

Engels, B. and Dietz, K., eds. (2017). *Contested Extractivism, Society and the State: Struggles over Mining and Land*. London: Palgrave Macmillan.

Eriksen, T. H. (2016). *Overheating: An Anthropology of Accelerated Change*. London: Pluto Press.

Evengård, B., Larsen, J. N., and Paasche, Ø. (2015). *The New Arctic*. Cham, Heidelberg, and New York: Springer.

Farish, M. C. (2010). *The Contours of America's Cold War*. Minneapolis: University of Minnesota Press.

Fjellheim, E. M. and Florian, C. (2020). 'Green' colonialism is ruining Indigenous lives in Norway. *Aljazeera online article.* www.aljazeera.com/opinions/2020/8/1/green-colonialism-is-ruining-indigenous-lives-in-norway

Flyen, A-C., Avango, D., Fischer, S., and Winqvist, C. (2023). Remediating mining landscapes. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Fondahl, G. and Wilson, G. N. (2017). *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Cham: Springer Nature.

Glacken, C. J. (1956). Changing ideas of the habitable world. In W. L. Thomas Jr., ed., *Man's Role in Changing the Face of the Earth*. Chicago and London: The University of Chicago Press, pp. 70–92.

Goody, J. (2012). *Metals, Culture and Capitalism: An Essay on the Origins of the Modern World*. Cambridge: Cambridge University Press.

Grace, S. E. (2002). *Canada and the Idea of North*. Montreal: McGill-Queen's University Press.

Haff, P. (2014). Humans and technology in the Anthropocene: Six rules. *The Anthropocene Review*, 1(2), 126–136. https://doi.org/10.1177/2053019614530575

Hansen, S. (2017). Key techniques in the production of metals in the 6th and 5th millennia BCE: Prerequisites, preconditions and consequences. In Joseph Maran and Philipp Stockhammer. eds, *Appropriating Innovations: Entangled Knowledge in Eurasia, 5000–1500 BCE*, 136–148. Oxford and Haverton, PA: Oxbow Books.

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Hara, K. and Coates, K., eds. (2014). *East Asia-Arctic Relations: Boundary, Security and International Politics*. Montreal: McGill-Queen's University Press.

Harvey, D. (1990). *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*. Cambridge, MA: Blackwell.

Haycox, S. (2002). *Frigid Embrace: Politics, Economics, and Environment in Alaska*. Corvallis: Oregon State University Press.

Herva, V-P., Komu, T., and Paphitis, T. (2023). Extraordinary underground: Fear, fantasy and future extraction. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Higgins, P. (2011). *Eradicating Ecocide: Laws and Governance to Prevent the Destruction of Our Planet*. London: Shepheard-Walwyn.

Higgins, P., Short, D., and South, N. (2013). Protecting the planet: A proposal for a law of ecocide. *Crime, Law and Social Change*, 59(3), 251–266. https://doi.org/10.1007/s10611–013-9413-6

Högselius, P. (2012). *Red Gas: Russia and the Origins of European Energy Dependence*. Basingstoke and New York: Palgrave Macmillan.

Humphreys, M., Sachs, J., and Stiglitz, J. E. (2007). *Escaping the Resource Curse*. New York: Columbia University Press.

Humphris, J., Charlton, M. F., Keen, J., Sauder, L., and Alshishani, F. (2018). Iron smelting in Sudan: Experimental archaeology at The Royal City of Meroe. *Journal of Field Archaeology*, 43(5), 399–416. https://doi.org/10.1080/00934690.2018.1479085

IGS, Institute of Geological Sciences. (1978). *World Mineral Statistics 1970–74*. London: His Majesty's Stationery Office. www2.bgs.ac.uk/mineralsuk/download/world_statistics/1970s/WMS_1970_1974.pdf

IMRB, Imperial Mineral Resources Bureau. (1921). *The Mineral Industry of the British Empire and Foreign Countries. Statistical Summary 1913–1920*. London: His Majesty's Stationery Office. www2.bgs.ac.uk/mineralsuk/download/world_statistics/1910s/SS_1913_1922.pdf

IPCC, Intergovernmental Panel on Climate Change. (2021). Summary for policymakers. In V. Masson-Delmotte et al., eds., *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. pp. 3–32.

Jardim, E. (2017). *From Smart to Senseless: The Global Impact of 10 Years of Smartphones*. Washington, DC: Greenpeace.

Jones, M. K. (2008). Swedish Scientific Expeditions to Spitsbergen, 1758–1908. *TijdSchrift voor Skandinavistiek*, 29(1–2), 219–235.

Josephson, P. (2011). Technology and the Conquest of the Soviet Arctic. *Russian Review*, 70(3), 419–439. www.jstor.org/stable/41289976

Josephson, P. (2014). *The Conquest of the Russian Arctic*. Cambridge, MA: Harvard University Press.

Keeling, A. and Sandlos, J., eds. (2015). *Mining and Communities in Northern Canada: History, Politics, and Memory*. Calgary: University of Calgary Press.

Killick, D. and Fenn, T. (2012). Archaeometallurgy: The study of preindustrial mining and metallurgy. *Annual Review of Anthropology*, 41(1), 559–575. www.annualreviews.org/doi/10.1146/annurev-anthro-092611-145719

Klein, N. (2014). *This Changes Everything: Capitalism Vs. the Climate*. New York: Simon & Schuster.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Klinger, J. M. (2015). A historical geography of rare earth elements: From discovery to the atomic age. *The Extractive Industries and Society*, 2(3), 572–580. https://doi.org/10.1016/j.exis.2015.05.006

Koch, N. and Perreault, T. (2019). Resource nationalism. *Progress in Human Geography*, 43(4), 611–631. https://doi.org/10.1177/0309132518781497

Kruse, F. (2016). Historical perspectives: The European commercial exploitation of Arctic mineral resources after 1500 AD. *Polarforschung*, 86(1), 15–26. https://doi.org/10.2312/polarforschung.86.1.15

Labban, M. (2014). Deterritorializing extraction: Bioaccumulation and the planetary mine. *Annals of the Association of American Geographers*, 104(3), 560–576. https://doi.org/10.1080/00045608.2014.892360

Lenton, T. M. (2012). Arctic climate tipping points. *Ambio*, 41(1), 10–22. https://doi.org/10.1007/s13280–011-0221-x

Lertzman, D. A. and Vredenburg, H. (2005). Indigenous peoples, resource extraction and sustainable development: An ethical approach. *Journal of Business Ethics*, 56(3), 239–254. https://link.springer.com/article/10.1007/s10551–004-3528-8

Lewis, S. L. and Maslin, M. (2018). *The Human Planet: How We Created the Anthropocene*. New Haven, CT: Yale University Press.

Lien, M. E. (2023). Beyond mining: Repair and reconciliation. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Lövbrand, E., Mobjörk, M., and Söder, R. (2020). The Anthropocene and the geo-political imagination: Re-writing Earth as political space. *Earth System Governance*, 4, 100051. https://doi.org/10.1016/j.esg.2020.100051

Macadam, J. (2011). *The Arctic Coal Rush: Spitsbergen and the British Imagination 1910–1920*. Cambridge: Scott Polar Research Institute, University of Cambridge. https://doi.org/10.17863/CAM.12845

Main-Klingst, L. (2021). An international definition for the crime of ecocide: Interview with Philippe Sands. American Bar Association Online article. www.americanbar.org/groups/environment_energy_resources/publications/ierl/20210615-an-international-definition-for-the-crime-of-ecocide/

Malm, A. (2016). *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming*. New York and London: Verso.

Malm, A. and The Zetkin Collective. (2021). *White Skin, Black Fuel: On the Danger of Fossil Fascism*. London: Verso.

Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition: Arctic legacies. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Margiotta, S. and Sansò, P. (2017). Abandoned quarries and geotourism: An opportunity for the Salento Quarry District (Apulia, Southern Italy). *Geoheritage*, 9, 463–477. https://doi.org/101007/s12371–016-0201-4

McGwin, K. (2021). Greenland halts new oil exploration. Arctic Today online article. www.arctictoday.com/greenland-issues-halt-to-new-oil-exploration/

McNeill, J. R. and Engelke, P. (2014). *The Great Acceleration: An Environmental History of the Anthropocene since 1945*. Cambridge, MA: The Belknap Press of the Harvard University Press.

Mitchell, T. (2011). *Carbon Democracy: Political Power in the Age of Oil*. London: Verso.

Mitman, G. (2018). Hubris or Humility: Genealogies of the Anthropocene. In G. Mitman, M. Armiero, and R. S. Emmett, eds., *Future Remains: A Cabinet of Curiosities for the Anthropocene*, Chicago: University of Chicago Press, pp. 59–68.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Morse, K. (2003). *The Nature of Gold: An Environmental History of the Klondike Gold Rush*. Seattle: University of Washington Press.

Nielsen, H. and Knudsen, H. (2013) Too hot to handle: The controversial hunt for uranium in Greenland in the Early Cold War. *Centaurus*, 55(3), 319–343. https://doi.org/10.1111/1600-0498.12020

Nilsson, A .E. and Sarkki, S. (2023). Scenarios and surprises: When change is the only given. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Norgaard, K. M. (2011). *Living in Denial: Climate Change, Emotions, and Everyday Life*. Cambridge, MA: The MIT Press.

NSIDC, National Snow & Ice Data Center. (2020). Climate Change in the Arctic. NSIDC Website. https://nsidc.org/cryosphere/arctic-meteorology/climate_change.html

Nuttall, M. (2017). *Climate and Subsurface Politics in Greenland: Under the Great Ice*. Abingdon, Oxon: Routledge.

New York Times. (2021). Biden Suspends Drilling Leases in Arctic National Wildlife Refuge. NYT online article. www.nytimes.com/2021/06/01/climate/biden-drilling-arctic-national-wildlife-refuge.html

Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Paglia, E. (2018). The telecoupled Arctic: Assessing stakeholder narratives of non-Arctic states. In N. Wormbs, ed., *Competing Arctic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan, pp. 189–212.

Paglia, E. (2020). A higher level of civilisation?: The transformation of Ny-Ålesund from Arctic coalmining settlement in Svalbard to global environmental knowledge center at 79° North. *Polar Record*, *56*. https://doi.org/10.1017/S0032247419000603

Piper, L. (2009). *The Industrial Transformation of Subarctic Canada*. Vancouver: UBC Press.

Reuters. (2021). 'The People vs Arctic Oil': Climate Activists target Norway at Human Rights Court. Reuters online article. www.reuters.com/business/environment/the-people-vs-arctic-oil-climate-activists-target-norway-human-rights-court-2021-06-15/

Ritchie, H. and Roser, M. (2020). "Fossil Fuels". OurWorldInData.org online publication. https://ourworldindata.org/fossil-fuels#fossil-fuel-consumption-by-type

Rockström, J., Steffen, W., Noone, K., et al. (2009). A safe operating space for Humanity. *Nature*, 461, 472–475. https://doi.org/10.1038/461472a

Rosqvist. G., Heikkinen, H. I., Suopajärvi, L., and Österlin, C. (2023). How should impacts be assessed? In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Ross, M. (2012). *The Oil Curse: How Petroleum Shapes the Development of Nations*. Princeton, NJ: Princeton University Press.

Ruban, D. A. (2020). Geological heritage of the Anthropocene epoch: A conceptual viewpoint. *Heritage*, 3, 19–28. https://doi.org/10.3390/heritage3010002

Runciman, D. (2019). Democracy is the Planet's Biggest Enemy. Foreign Policy online article. https://foreignpolicy.com/2019/07/20/democracy-is-the-planets-biggest-enemy-climate-change/

Sands, P. (2016). *East West Street: On the Origins of Genocide and Crimes against Humanity*. London: Weidenfeld & Nicolson.

Sejersen, F. (2015). *Rethinking Greenland and the Arctic in the Era of Climate Change: New Northern Horizons*. London and New York: Routledge.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Smith, B. and Waldner, D. (2021). *Rethinking the Oil Curse*. Cambridge: Cambridge University Press.

Smith, L. C. (2011). *The New North: Our World in 2050*. London: Profile Books.

Sokolíčková, Z. and Eriksen, T. H. (2023). Extraction cultures in Svalbard: Frommining coal to mining knowledge and memories. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Sörlin, S. (1988). *Framtidslandet: Debatten om Norrland och naturresurserna under det industriella genombrottet*. Stockholm: Carlsson.

Sörlin, S. (2015). The emerging Arctic humanities: A forward-looking post-script. *Journal of Northern Studies*, 9(1), 93–98. www.jns.org.umu.se/JNS_1_2015.pdf

Sörlin, S. (2017). The Arctic Ocean. In D. Armitage, A. O. Bashford, and S. Sivasundaram, eds., *Oceanic Histories*. Cambridge: Cambridge University Press, pp. 269–295.

Sörlin, S. (2021a). Wisdom of affect? Emotion, environment, and the future of resource extraction. *Polar Record*, 57, e27. https://doi.org/10.1017/S0032247421000097

Sörlin, S. (2021b). Is there such a thing as 'best practice'?: Exploring the extraction/sustainability dilemma in the Arctic. In D. C. Nord, ed., *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action*. Cham: Springer Nature. pp. 321–348. https://ebin.pub/nordic-perspectives-on-the-responsible-development-of-the-arctic-pathways-to-action-1st-ed-9783030523237-9783030523244.html

Sörlin, S. Dale, B., Keeling, A., and Larsen, J.N. (2023). Patterns of Arctic extractivism: Past and present. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Storm, A. (2014). *Post-Industrial Landscape Scars*. New York: Palgrave MacMillan.

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., Biggs, R., Carpenter, S. R., de Vries, W., de Wit, C. A., Folke, C., Gerten, D., Heinke, J., Mace, G. M., Ramanathan, V., Reyers, B., and Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223), 736–746. https://doi.org//10.1126/science.1259855

Swanson, H. A. (2016). Anthropocene as political geology: Current debates over how to tell time. *Science as Culture*, 25(1), 157–163. https://doi.org/10.1080/09505431.2015.1074465

Tsosie, R. (2007). Acknowledging the past to heal the future: The role of reparations for native nations. In J. Miller and R. Kumar, eds., *Reparations: Interdisciplinary Inquiries*. Oxford University Press, pp. 47–68.

USGS, United States Geological Survey. (2008). Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle. USGS Fact Sheet 2008-3049. https://pubs.usgs.gov/fs/2008/3049/fs2008–3049.pdf

Vikström, H. (2020). Producing electric light: How resource scarcity affected light bulbs, 1880–1914. *Technology and Culture*, 61(3), 901–922. 10.1353/tech.2020.0078

Vikström, H. and Högselius, P. (2017). From cryolite to critical metals: The scramble for Greenland's minerals. In R. C. Thompsen and Bjørst, L. R., eds., *Heritage and Change in the Arctic*. Aalborg: Aalborg University Press, pp. 177–211.

Walker-Crawford, N. (2020). Scaling responsibility: Andean responses to climate disaster. PhD diss. Manchester University.

Washington Post (2021). Biden officials move to reinstate Alaska roadless rule, overturning Trump policy. Washington Post online article. www.washingtonpost.com/climate-environment/2021/06/11/tongass-roadless-rule/

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Wilson, E. and Stammler, F. (2016). Beyond extractivism and alternative cosmologies: Arctic communities and extractive industries in uncertain times. *The Extractive Industries and Society*, 3 (1), 1–8. https://doi.org/10.1016/j.exis.2015.12.001

Wolf, S. (2010). *Extinction: It's not Just for Polar Bears*. San Francisco: Center for Biological Diversity. www.biologicaldiversity.org/programs/climate_law_institute/the_arctic_meltdown/pdfs/ArcticExtinctionReport_Final.pdf

Wormbs, N. (2018). Introduction: Back to the future of an uncertain Arctic. In N. Wormbs, ed., *Competing Artic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan, pp. 1–18.

Wråkberg, U. (1999). Politik och vetenskap i A.E. Nordenskiölds ockupationsförsök av Spetsbergen år 1871-1873. In U. Wråkberg, ed., *Arktisk gruvdrift: Teknik, vetenskap och historia i norr*. Stockholm: Jernkontoret, pp. 39–52.

Zalasiewicz, J., Waters, C. N., and Williams, M. (2014). Human bioturbation, and the subterranean landscape of the Anthropocene. *Anthropocene*, 6, 3–9. https://doi.org/10.1016/j.ancene.2014.07.002

Zalasiewicz, J., Waters, C. N., Williams, M., and Summerhayes, C. P. (2019). *The Anthropocene as a Geological Time Unit: A Guide to the Scientific Evidence and the Current Debate*. Cambridge: Cambridge University Press.

Zeller, S. (1989/2009). *Inventing Canada: Early Victorian Science and the Idea of a Transcontinental Nation*. New ed. Montreal: McGill-Queen's University Press.

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I

Extractivism

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2

Patterns of Arctic Extractivism

Past and Present

SVERKER SÖRLIN, BRIGT DALE, ARN KEELING, JOAN NYMAND LARSEN

How can we understand the "big picture" of Arctic mining? As a backdrop to what follows in the rest of the volume, this chapter provides an outline of the resource extraction history of the Arctic. We focus mainly on historical resource extraction in the European Arctic, with brief comparisons with Arctic North America and Russia. The chapter is also an attempt to reinterpret and reconfigure the extractive past and present of the Arctic using *extractivism*, presented in the previous chapter, as a framing concept and theoretical tool. What were the main patterns of Arctic extractive history during the industrial period and are there deeper historical patterns that can be identified in this moment of intensifying resource extraction?

We explore this question along four main themes: the *extractive frame of mind* in Western thought and Arctic visions; the *material and social impacts* of historical extractivism; the *ties of extractivism to Arctic colonialism* and modern "development"; and the emergence of *debates around contemporary and future extractivism* and its implications for Arctic territories and peoples.

Natural resource extraction has grown to global significance as the basis for industrial modernity (Sörlin, 2023, see Chapter 1). This modernity emerged with the Industrial Revolution, accelerated dramatically during the twentieth century, and is now changing rapidly because of new growth in East Asian and other economies beyond the Euro-Western world. It may be argued, as currently takes place in a growing literature in innovation and transition studies, that it is undergoing ruptures and stands at a crossroads (Kanger et al., 2022). Extractive industrial modernity produced particular kinds of societies, based on values linked to gender, ethnic, and social hierarchies and with largely unsustainable economies. This modernity is increasingly being challenged, and political and cultural tensions around extractive industries have grown far beyond those we saw in past controversies around preservation and conservation. It is in this emerging, uncertain world that we must locate Arctic extractivism. Is the latter on the crest of the wave of change or caught up in a region resistant to change, bogged down in extractivist patterns of the past?

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There are multiple framing narratives of extractivism, and Arctic stories represent just some of these. In contrast to the singularizing "New North" narrative that we have often heard from policy and media since the end of the Cold War, the Arctic holds, and has always held, several distinct potential pathways with different trajectories, chronologies, and politics (Stuhl, 2016). Indeed, the fact that the future is undetermined has spawned notions of "competing Arctic futures" (Wormbs, 2018) but also, as transformational change is increasingly likely worldwide, the possibility for a plurality of "dynamic sustainabilities" (Leach, Scoones, & Stirling, 2010). Extractivism – particularly mining and oil and gas activities – has been a fraught issue for a long time and remains disputed in many of these narratives. To make things even more complicated, critics and advocates of extractivism may be located on "both sides" of the divide for or against mineral and oil and gas extraction. Extractivist advocates can be found, perhaps most usually, among settler residents and external actors (capital, extractive industries, government). But they also exist among some Indigenous groups (typically those with co-ownership to either land or infrastructure such as native corporations in Alaska), political activists, and scientists, although these groups typically would also be well represented amongst opponents to extraction that exceeds the artisanal, Indigenous, and/or small-scale.

Extractivism in the Arctic is changing, as we can start to discern the contours of a post-fossil fuel society and as the future of traditional mining is uncertain in many places of the world. That said, the transition toward a low carbon future will require tremendous investment in mineral extraction including rare earth minerals (Prior et al., 2012; Gilberthorpe & Hilson, 2014; Rossi et al., 2021; Sörlin, 2021, 2023, see Chapter 1; Lien, 2023, see Chapter 12). Extractivism itself is connected to post-fossil fuel futures: certain minerals are central to electrification, renewable energy infrastructure such as solar panels and wind turbines, and extractive elements may be detected in the seemingly post-material versions of Arctic economies, such as tourism, education, science, and culture (Sokolíčková & Eriksen, 2023; see Chapter 3). This phenomenon implies that extractivism should perhaps be seen as *a socio-economic formation* in deep resonance with these ongoing transformations just as much as it is a historical "hole in the ground" tied to certain waning commodities or forms of energy.

The roots of these contemporary debates around extractivism, this chapter argues, are located in the overarching dynamic of Anthropocene transformations in which diverse histories of extractivism in the modernizing Arctic are nested. The overall argument, which is based on conclusions from recent research on resource extraction in the global north, is that extractivism over a long period of time grew into the predominant framing concept in relation to the Arctic (Southcott et al., 2018). Shaped by largely Western attitudes to non-human nature as resource and

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property, extractive thinking propelled European expansion and colonization all through the circumpolar Arctic, though with varying historical trajectories and geopolitical consequences. Indigenous peoples, long the occupants and stewards of Arctic territories, were largely marginalized in this process, though they engaged in various forms of accommodation, co-option, and outright resistance.

The legacies of modern extractivism – as economic modality, as material practice, and as mentality – continue to shape debates and developments in the region today, as well as informing contested visions for its future.

Extractivism: A Framing Western Concept

Extraction of mineral resources has been a preoccupation of Arctic states for centuries. Antecedents of modern extractive development stretch back to the early modern period (especially in Scandinavia), and Indigenous metals technology and trade predate colonial forms by thousands of years (Knudsen, Keeling & Sandlos, 2022). Extraction has also been part of annexation and colonization policies, and worked in tandem with the formation of Arctic nation states, territorially as well as politically (Coates, 2018). Arctic Indigenous communities with considerably longer histories in the region did not engage in modern capitalist forms of mineral extraction, but some Sámi, Inuit, and others did occasionally work in mines, sometimes as forced labor. An almost universal feature of Arctic extractivism is that it took place at a distance from major urban centers usually located in the southern portion of those Arctic states. At the same time, states, through colonization, trade, and military activity, sought to bridge that distance by extending infrastructure, social services, local government and authority (Adcock, 2008), and civic rights to Indigenous peoples and frontier populations within their territory. This has its challenges since people living in cities and towns add up to the large majority of the four million people (Arctic Centre, 2021) that inhabit the Arctic, an area much larger than Europe, which for comparison has a population of 750 million.

In seeking to make sense of the Arctic and its importance during the first two decades of the twenty-first century, historians and others turned to the notion of extractivism as a framing concept for these transformations wherever they occurred. It was never meant to indicate a predetermined form or stage of development, nor is it the only way one can imagine responsible resource extraction in the future. Indeed, the "wastelanding" (Voyles, 2015) and environmental racism that has frequently been the result of mining projects in different world regions, and certainly in the Arctic (Keeling & Sandlos, 2009; Wilson & Stammler, 2016; Kuokkanen 2019), are just some of several potential results of these activities. So, while alternatives exist, why are destructive consequences of mining so hard to avoid?

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Part of the reason lies in the deeper historical roots to extractivism and how it has played out in colonial contexts around the world. In the Arctic, extractivism is underlain by a particular socio-cultural orientation toward the northern environment that conceives it as a distant storehouse of resources and an extractive frontier. This perspective has roots (particularly in the European Arctic) in deeply religious and cultural attitudes toward nature in addition to the incentives provided by the global manifestations of European capitalism. Even as we are moving into an economy that has already started de-coupling wealth and economic growth from the use of traditional mineral and fossil-based resources, resource extraction in the Arctic is still caught in the extractivist paradigm following long historical lines (McCannon, 2012; Josephson, 2014; Nuttall, 2017). What we see in the Arctic is a pattern of extractivism that keeps reinventing itself in new guises, adapting to changing circumstances, and increasingly in tension with multiple actors and with demands for less intrusive, genuinely consultative, socially just, and more sustainable solutions. How and when will this prevailing Arctic extractivism transform, if not discontinue? Will new extractivist patterns emerge in industries such as tourism, energy production, strategic minerals, and marine protein farming, or are other development pathways possible?

Changing human–nature relationships requires rethinking historical, cultural, and religious definitions of Man's superiority on Earth and the perceived human "right" to its resources. In contrast to "nature," "resources" is a redefinition of "natural things" into objects that are somehow deemed more or less useful for humans, and which in the capitalist era can be monetized. What these objects are and what their value is, even that they constitute "resources," objects of extraction, has changed with time and will continue to do so (De Gregori, 1987; Bridge, 2009).

Already, the Early Modern revolution of natural philosophy has legitimized the sense that Man's destiny is to dominate and exploit a nature "out there," a mechanized nature in which humans had no part. Man replaced God and put himself in a position *beyond nature*. This represented no shift from the Judeo-Christian tradition, however, as Man was seen also in biblical times as being the steward of Creation, and the benefactor of all goods that could be drawn from it (as in for instance Genesis 2:19). The combination of the Christian anthropocentric notion of the world, where Man is regarded as God's representative on Earth, and the Athenian focus on the nature of Man and his ability to make sense of the world constructed a reality where "Christianity absorbed the anthropocentric dominance views of Platonic-Aristotelian Greek philosophy" (Sessions, 1977: 486). This, in turn, helped pave the way for the future rationalization of man's utilization of the resources of the planet. Influential feminist thinkers (e.g., Merchant, 1980) have argued that it would be reasonable to ascribe the subsequent appropriation of the natural world to the premise that the observing and acting human subject was

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firmly placed – both epistemologically and morally – *outside of nature*. In a colonial frame of mind, "nature" thus turned into objects of value ("resources") or "marvelous possessions" (Greenblatt, 1991) that could be controlled, owned, and exploited.

The appropriation of the Arctic by representatives of this Christian culture and mind frame stands in a long line of confrontations, literally around the world, with what colonialists perceived as pristine, untamed nature that could be appropriated and mastered in new ways. Frontier landscapes were the manifestation of God's gift to humankind, and the solution to the ever-increasing needs of societies for natural bounty. Men of Western science also played an important role as missionaries of the Christian faith in conquering the North. As Andrew Stuhl has argued about later incarnations of these colonizers in Alaska, " their concepts and research practices have accompanied efforts to conquer, cajole, civilize, capitalize, consume and conserve the far north since the late 1800s" (Stuhl, 2016: 2), and further back if we consider the European Arctic. Extractivism, as an extension of Man's God-given right to utilize the planet's resources, was deeply embedded in the rationale for a push to the north, as an expression of the century-old endeavor to "find the world's remaining unclaimed lands" (Stuhl, 2016: 3).

More recent and more secular ideas about land and resources followed that underlay colonial extractivist philosophy in the broadest possible traditions of political theory: Locke on labor, property, and the ethics of resource appropriation; Marx on labor, transformation of nature, and existential freedom. The ethical and philosophical foundations of extractivism are found in the very core of Western ideas of modernity, and the Arctic is no exception. Over time, they coalesced into broad developmental narratives that became embedded in extractivist thought, in the physical domination of landscapes and its riches, and in the relations to the people who inhabited it (Bridge, 2009; Richardson & Weszkalnys, 2014).

These ideas sharpened under industrial colonialism, resting on an assumption of virtuous transformation of raw materials to goods and societal value with little harm of any kind. The unquestionable harm wrought on local communities was justified with progressivist ideologies, articulated by several thinkers and, as extraction grew, by theorists of resource-centered imperialism (Hobson, 1902) and ideas about "control of the tropics" (Kidd, 1898), which also included "control of the Arctic." One of the key arguments in this literature was that since Indigenous populations neither would nor could exploit natural resources at this scale, it was both the right and a duty of the "civilized peoples" to do so. Civilization, as articulated by John A. Hobson, a progressive British economist and in fact a critic of imperialism, was ultimately characterized by a supreme capacity to extract and develop natural resources. According to this early version of the "gospel of efficiency" (Hays, 1959), wealth was going to spread across society, including,

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presumably, the far north, perceived by the most wishful visionaries as the future epitome of human civilization, justifiying continued hopes and projects to populate, promulgate, and excavate the Arctic in a noble "northward course of empire" (Stefansson, 1922).

Impacts on nature and on cultures, transforming both beyond recognition, were in the extractivist ideology considered largely favorably. "Landscape scars" (Storm, 2014) were the terraformed evidence of progress in an extractivist version of the "improvement of the world" idea that had been an ultimate legitimizing imaginary to guide British imperialism since the seventeenth century, long referring to agriculture and plantation economics, but in the nineteenth century turning decisively industrial and resource oriented (Gascoigne, 1998; Drayton, 2000). Similar ideas were advanced in French colonial thought (Rosenblum, 1988).

The Material Impacts of Extractivism

The extractivist mentality, as rendered in the previous section, provided the underlying rationale for the rapid industrial transformation of Arctic regions during the late Industrial Revolution and into the twentieth century. In a region defined – by many southern-based governments and industrial actors – in terms of remoteness, sparsity of population, and extremity of climate and landscape, mining, in particular, provided the catalyst for frontier development and colonization by modern states. Mining was a "frontiering" activity in the sense that it advanced the physical and social transformation of far away "wilderness" regions into resources for modern industry and governments, while implanting southern technologies and settlement forms into (largely) previously Indigenous territories (Knudsen et al., 2022). Indeed, extractivism materially reconfigured Arctic societies and spaces through the logic of resource extraction, whether undertaken via forms of "primitive accumulation" such as gold rushes, advanced industrial capitalist enterprises, or authoritarian, state-led development, as in the Soviet Union.

Industrializing markets, spurred by nationalist ideologies, as well as both capitalist and communist ambitions regarding the conquering of frontiers, led to a "race" for the Arctic and its resources. For instance, the large-scale iron mining complexes of northern Sweden emerged at the end of the nineteenth century after the completion of a rail line from Malmberget and Kiruna to tidewater (at Luleå and Narvik, Norway) opened the region's rich iron resources to European markets. The logistics created by the mine, with hydroelectric power stations and power lines, built, in the early 1900s, what was then the largest single infrastructure system in northern Fennoscandia (Hansson, 2006). Other large developments followed as the Swedish Arctic rapidly industrialized and new settlements were established in this multilingual, culturally rich region, also the home of the Sámi.

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Although on a smaller scale, Norwegian and Finnish mining also expanded as part of concerted efforts to extend state control over Arctic territories and with similar tensions.

The Soviet Arctic, too, saw large-scale settlements develop around extractive sites, particularly in the Kola Peninsula region and, to a lesser extent, in the Russian Far East. These industrial centers, however, emerged out of authoritarian state initiatives (such as Stalin's Five Year Plans) to develop Arctic resources and infrastructure, rather than flows of mining capital (Josephson, 2014; Wilson & Stammler, 2016). The infamous Kolyma gold mines were integrated into the brutal Gulag system of forced labor and, to some extent, forced and induced settlement was a feature of many Soviet Arctic mining communities. Today much activity in Arctic Russia is fly-in-fly-out, and the future of mining in these areas must be considered alongside phenomena such as the thawing of permafrost, which, ironically, can be exploited for a new version of Anthropocene tourism in the Pleistocene Mammoth Park in the Yamal region, Siberia (Wrigley, 2020).

In the North American Arctic and subarctic, gold rushes to Canada's Yukon territory and the Alaskan territory acquired by the United States in 1867 were catalytic events, bringing non-Indigenous migrants and settlers, and leading to further industrial transformations of the vast, hitherto Indigenous-controlled region. Unlike the diverse economies and settlements that emerged in the Scandinavian Arctic, however, the region's transportation and settlement geography centered on small-scale, remote, and often ephemeral and unstable extractive sites (Keeling & Sandlos, 2015). Similarly, Greenlandic mining remained a highly sporadic, yet at times influential, driver of colonial extractive activity. Mining settlements were founded around cryolite and coal deposits, promising the potential for re-orienting the hunting-based Greenlandic economy toward industrialism (and, for some Greenlanders, a path to self-determination). Nevertheless, unlike other Arctic regions during the twentieth century, Greenland remained largely at the margins of sustained mining activities due to the transportation and environmental challenges of its Arctic location, and because it was defined as a zone of strategic interest dominated by the American military rather than as a commercial development (Doel, Harper, & Heymann, 2016).

For all their diverse histories and material circumstances, the many mineral developments around the circumpolar region collectively illustrate the broad trends and processes of extractivism – with an Arctic flavor. Consider the Black Angel Mine: situated near a former marble quarry at Maarmorilik in the Uummannaq district of Greenland's north-central west coast (Figure 2.1), the remote site attracted interest for its lead-zinc deposits during a boom in demand for these minerals in the 1960s. Through its Danish subsidiary Greenex, and with the strong backing of the Danish government, the Canadian mining giant Cominco brought

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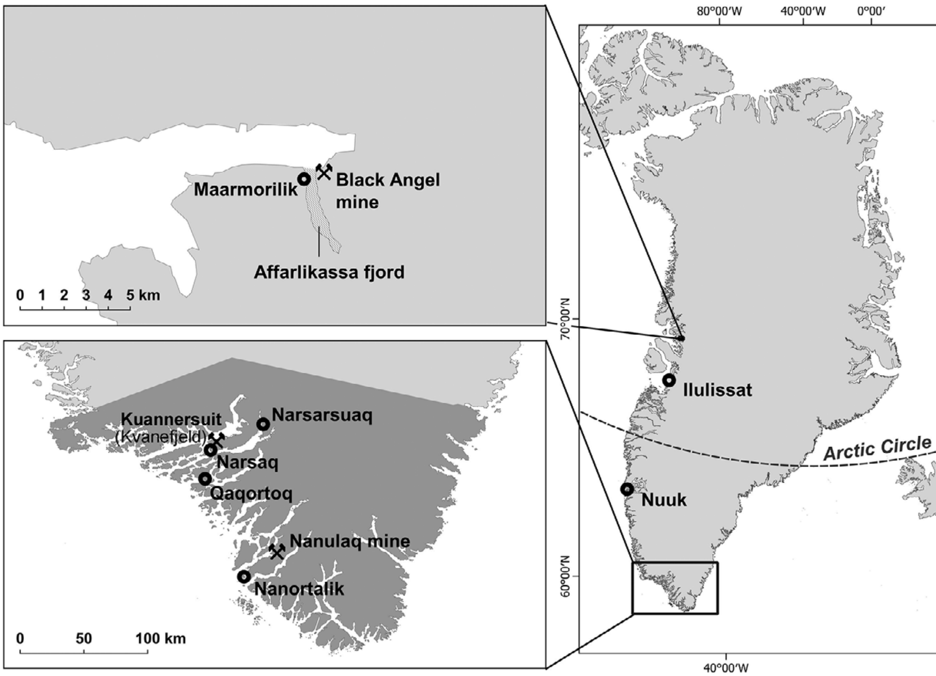

Figure 2.1 Location map of Greenland. Drawn by Christian Fohringer.

its considerable experience in northern mining (including contemporaneous efforts to develop a High Arctic mine near Resolute in Canada) and sulphide ore processing technology to exploit this deposit. The mine was accessed rather dramatically some 600 meters up the side of a mountain via cable car, which also transported ore to a processing facility by the Affarlikassa Fjord. When it opened in 1973, the mine promised employment opportunities for Greenlanders, although most workers were employed on a fly-in-fly-out basis, and local Indigenous labor participation remained low. In fact, Greenlandic workers went on strike in 1977, protesting against unequal wages and the strict social controls of the company mining camp (Knudsen et al., 2022).

The mine also proved controversial for its impacts on local environments and livelihoods: along with enduring smoke and dust from the refinery, hunters in the area blockaded an ore ship in 1975 to protest the impact of spring icebreaking on sea ice travel. It left a legacy of water pollution resulting from the disposal of tailings into the fjord, contaminating nearby waters and marine organisms, including harvestable fish, with lead and zinc for decades after the mine's closure in 1990 (Eberling et al., 2002). As with so many remote Arctic sites, while the economic benefits of mining (and its associated infrastructure) proved ultimately

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fleeting, its effects on society and environment reverberated for long after closure. In particular, in spite of its short life the mine nurtured the vision of increasing self-determination by Greenlanders, a vision that has persisted in debates around uranium mining and offshore oil development (discussed later; Bjørst, Sejersen & Thisted 2023, see Chapter 7).

Of course, the Black Angel story is not that of every Arctic mine. Some mining regions flourished for decades, either from new mineral opportunities or diversified economies. Much of Arctic Fennoscandia, while embracing the industry, in fact relies very little on it for employment while benefiting from the associated investment and infrastructure, a legacy of an earlier commitment to populate mining regions and build functional communities (Malmgren et al., 2023, see Chapter 11). Towns and cities in North America with their origins in mining booms – Yellowknife, Whitehorse, and Juneau, for instance – have matured into administrative centers while continuing their role as transportation and service hubs for extractive industries (Piper, 2009). While the Arctic remains, in a global context, a resource periphery or "primary commodity supply zone," new economic and political arrangements, most notably the growing influence of Arctic Indigenous peoples, have shifted the balance toward the capture and retention of mining's benefits by the region's population.

Nevertheless, the "landscape scars" (Storm, 2014) of previous rounds of largely settler-colonial forms of extractivism remain, along with "imperial debris" (Stoler, 2013) in a lingering volumetric and vertical environment (Dodds, 2021). They are frequently invoked in the disputes over modern open pit "mega-mines" and power infrastructures that disrupt surface-level reindeer herding (Röver, 2021) and other traditional lifestyles, the impact of Arctic ore shipping disrupting the solidity of sea ice, or contemporary efforts to address the toxic subterranean legacies of abandoned and un-reclaimed mine sites around the region. The toxic experiences and lessons of this extractive past are frequently invoked as Arctic communities today continue to debate the merits and pitfalls of minerals-led development for their region (Nuttall, 2017; Dale, Bay-Larsen, & Skorstad, 2018).

Extractivism and European Arctic Colonialism

While coloniality and colonialism is the evident frame for resource extraction in North America and Greenland, there has been a lot of debate about whether the relations to northern regions should be termed colonial in the European and the Russian context. In the wake of 1960s and 1970s dependency theories (e.g., Samir Amin, André Gunder Frank, Raúl Prebisch) explaining underdevelopment in the former colonial world after the Second World War (Blomström & Hettne, 1984; Munck & O'Hearn, 1999), this framing was often suggested for Arctic regions

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as well. Extractive industries were presented as a main contributor to the onslaught against remote areas in northern Fennoscandia, in Greenland as part of the Kingdom of Denmark, and in imperial and Soviet Russia. An argument against this claim, besides opposing its intellectual content and explanatory capacity, was that Russia, Sweden, Norway (after being part of Denmark until 1814), and Finland (after being part of Sweden until 1809 and a principality of Russia until 1917) were Arctic states in their own right, with much of their territory north of the 60th parallel. Resource extraction took place in their own northern hinterland territories and hence could not, by definition, be "colonial" or imperialist. Also, was not the building of infrastructures and the influx of capital, largely provided by states and empires, necessary for modernization?

Arctic resource exploitation was far from fair. It was based on dominant "southern" ideologies of race, civilization, and religion that put Arctic Indigenous peoples in a subordinate position. Models of extraction were disturbingly similar to those that were used in overseas European colonialism. Theorists of "internal colonialism" (Chaloult & Chaloult, 1979; Calvert, 2001; Pinderhughes, 2011; van de Grift 2015) also suggested that colonialism was deeply related to "hinterland" exploitation, and that exploitative resource extraction could just as well be part of domestic practice and politics. After all, expanding settler communities had infringed on Indigenous populations, turning them into subjects without consultation and then disregarding what has only recently been acknowledged as their rights. Extractive industries mattered in this, although in the sixteenth and seventeenth centuries multi-national exploitation of maritime resources such as whale and seal was still more intense (Sörlin, 2017; Demuth, 2019).

In the long, often dark history of extractive industries in the European Arctic (Naum & Nordin, 2013), ethical and political constraints on mining were weak and mining practices often oppressive and cruel. Early examples of such impacts can be found in the Fennoscandian region (Figure 2.2) in the seventeenth and eighteenth centuries, such as the Swedish Nasafjäll mining case (Bromé, 1923; Awebro, 1983), or in the Torne River Valley on the current Finnish–Swedish border (Nordin & Ojala, 2015, 2020). The silver mine in Nasafjäll on the Arctic circle, close to the border with Denmark-Norway, was opened in the 1630s. It would have been an unattainable project if Sámi had not been forced to work in the open air mine and, in particular, with the long-haul transportation of the ore with reindeer and *akkja* (the Sámi sled) to a smelting site in Silbojokk (Sámi for silver creek) some 100 kilometers away. They were paid with flour, salt, tobacco, and liquor. Two more silver mines (Kedkevare, Alkavare) were also started, both short lived, ending in 1703 (Awebro, 1983; Abrahamsson, 2009). The harsh conditions for extraction in some of the northern mines were known to the authorities but not much debated, even after a critical report in 1908 covering the Early Modern

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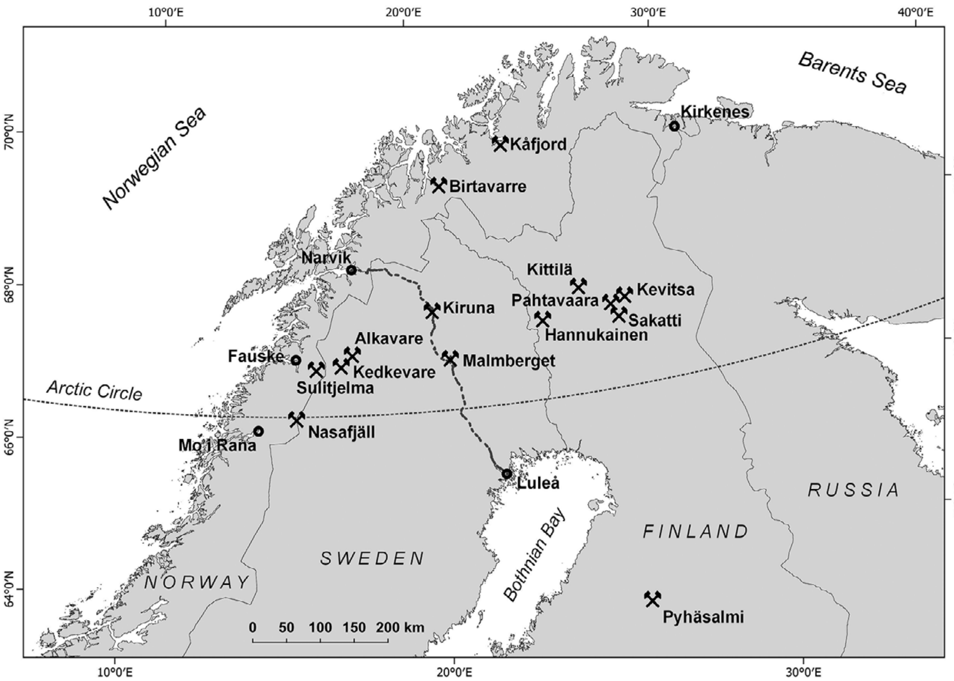

Figure 2.2 Location map of Fennoscandia. Drawn by Christian Fohringer.

Swedish mining experience (Sommarin, 1908). In the eighteenth and nineteenth centuries, Fennoscandian Arctic mining interests turned toward iron ore, but the regard for Sámi interests remained marginal. Sámi were generally avoided as mining labor because they were considered to be unreliable and too attracted by their traditional way of life, a persistent trope. By the same token, the Sámi tried to avoid work in mining (Figure 2.3).

In the nineteenth century, mining gained a foothold and grew rapidly in the Norwegian north, based on investments from English and Norwegian/ Danish capital. Historian Einar-Arne Drivenes' classic analysis of the multiple income/ subsistence economy of Northern Norway, entitled *Fiskarbonde og gruveslusk* [fisher-farmer and miner] (Drivenes, 1985), depicts life and industrial development in some of the many mining towns in the region. Examples include the Kåfjord mine in Finnmark county, and the Birtavarre copper mine in Troms; its ore was supposedly found by a Sámi reindeer herder in the 1890s but commercially developed by Norwegian and English capital. The Sulitjelma copper mine in Nordland was also supposedly discovered by a Sámi, Mons Petter Uren, in 1858, and again developed by Norwegian and English owners. Drivenes assessed the number of workers to number a few hundred on each site, but many worked outside of the fishing and

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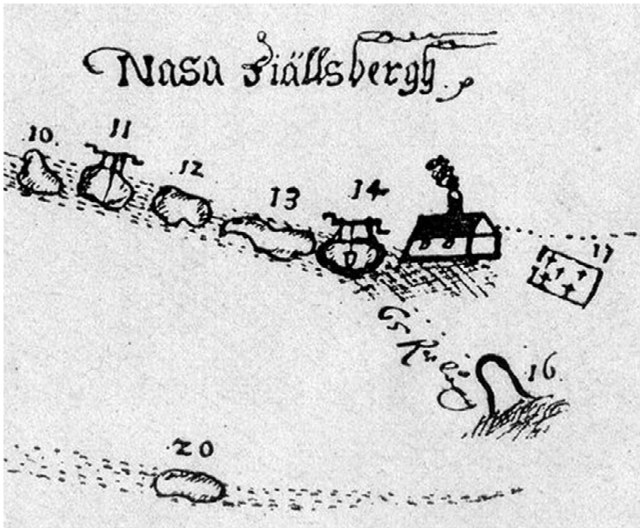

Figure 2.3 Detail of a map from 1646 of the Nasafjäll silver mine in Swedish Lapland by mining officer Hans Fredrik Lybecker the elder. The numbers refer to pitholes, except 17, which refers to the cemetery. Source: Bromé, J. (1923). Nasafjäll: Ett svenskt silververks historia. Stockholm: Nordiska bokhandeln

harvesting seasons, and were thus not fully employed; the numbers varied with global demand for the metals extracted (Drivenes, 1985: 43–67).

As the twentieth century drew closer, mines in Sør-Varanger, Mo i Rana, and Svalbard were opened, meaning that the relative importance of mining activities – and jobs – grew steadily in northern Norway. Asbjørn Jaklin describes the mine in Sulitjelma as "a mining sensation," employing more than 1,700 workers in 1907 (Jaklin, 2006: 61, our translation). These mines were part of a general trend in the region at the time where subsistence work on a farm was combined with (partial, but also for-cash) work in the fisheries and labor in the mines on and off, either in seasons or merely because mines would open and close irregularly. The mines also served to "Norwegianize" the region, as capital, the development of a labor force (with political ambitions), and urbanization (like in Mo i Rana, Kirkenes, and Fauske/Sulitjelma) increased state presence. Mining also favored Norwegian culture, competence, and economic advantage, further marginalizing Sámi culture and influence, in parallel with other state initiatives for cultural assimilation and "Norwegianization" (Minde, 2003), for instance through forced relocation and Norwegian-language education in government-run schools for children.

Similar assimilationist objectives supported and legitimized extractivism in Sweden. From the perspective of southern centers and national capitals, mining was regarded as the epitome of civilization and progress, and a necessary source of

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resources for the burgeoning urbanization accelerated by the industrial revolution. By the eighteenth century, it had become a state priority in the spirit of resource-oriented cameralism (Koerner, 1999), and strong central mining institutions linked to the state were organized to support the systematic discovery and use of valuable minerals and other resources. As described in the examples from Norway, capital from the national centers (all geographically far from the Arctic) also dominated and controlled the development of mining towns in the Swedish Arctic.

Extractivist ideologies underlay this appropriation of northern resources. These included mercantilism in the eighteenth century with import substitution and export income as a key goal underpinning national economies and expansionist northern strategies (Magnusson, 2015). Economic liberalism and, later, industrial socialism were equally confident in the virtues of mineral exploitation. The Fennoscandian north gradually developed a long-standing status as a "resource region," akin to but not similar to a "resource frontier" (see Van Alstine & Davies, 2017). The north was part of the national territory where wealth and prosperity could be found: a "land of the future" (Sörlin, 1988). When such hinterland visions started to circulate in the late nineteenth century it was as a "timber frontier." Industrial forestry began in southwestern Norway, rolled across northern Sweden from about 1850, then into northern Finland and by 1900 northwestern Russia. By the early twentieth century, most Arctic states had introduced and enforced mineral legislation, mostly to secure possessions, and presented ambitious schemes for large-scale resource extraction, terrestrial as well as marine. Regulation, including health and security, was slack, based on the assumption that the long-term positive effects of mining were overwhelming.

An unresolved issue that kept coming back was, for what purpose and whose benefit resource extraction was to occur? The interest of the state for war and wealth creation was of course central, so too were the commercial interests of investors and entrepreneurs. As industrialized extractivism and resource use spread from mining to forestry, fisheries, and energy resources (first turf, then hydroelectric power and oil and gas in the twentieth century) that were also abundant in the north, a legitimacy crisis grew. Public opinion gradually emerged suggesting that resources should benefit the region where they were extracted. This stood in contrast to repeated instances of intense but brief spurts of resource extraction (designed to address a national need or priority elsewhere) that had been the case with minerals but also with whale and seal blubber, coal and oil in Alaska, Svalbard, and North-Western Russia (Avango, Nilsson, & Roberts, 2013). These episodes were often short lived and ill-planned for the building of community. Again, it resembled the quest for colonies during high imperialism, which was a point often made in the critique of extractivism.

In retrospect, it is easy to see how this regime worked in parallel with other characteristics of industrial modernity such as a high valuation of technology, rationality, and an anthropocentric logic. It was underpinned by an emerging

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resource nationalism that was no less forceful in the Arctic than elsewhere (McCannon, 2012; Childs, 2016). Extractivism linked natural resources to the prowess and prosperity of the nation as a whole and the overall welfare of its citizens. Throughout most of this long period, generalized racism and ideas of Western and white supremacy were common, with little or no respect for Indigenous populations and their interests and livelihoods. This was not well articulated in previous research but has been rectified in recent years (Gaski, 1993; Fur, 2013; Fur & Hennessey, 2020). It sides with a longer history of discovery of problematic dimensions of Nordic welfare modernism, abusing minorities in public health and social care (Broberg & Roll-Hansen, 1996). A case can be made that this amounted to "resource colonialism" in the Scandinavian countries (Vikström, Högselius, & Avango, 2017; Avango, Högselius, & Nilsson, 2018). This kind of colonialism has been used to describe global forays into resource commerce and exploitation by major Swedish companies in Turkey, China, Africa, South Africa, Azerbaijan, Georgia, and elsewhere in the industrial period since the middle of the nineteenth century. But resource colonialism had started earlier, within Arctic Scandinavia, and it kept extending into the North Atlantic and Greenland.

These observations of changes in the extractive approaches can help us nuance the relation between resource extraction and colonialism in the European Arctic. Early modern extractivism was decisive, conscious, and underpinned by military and state-building interests in Europe. It started several hundred years ago to foster an instrumental state-centered interest in northern natural resources, explicitly – and perhaps even more implicitly – suggesting that their primary use was to strengthen the nation, defined as "south," rather than the future prosperity, freedom, and independence of northern regions and their populations. It was based on a staple trade commercial frame of thought. To this should be added an important element that distinguished Fennoscandia and to some extent Russia from Greenland and North America. In Fennoscandia, extractivism was accompanied by agriculture and fishing. It was colonialism in the literal sense, a population politics that stimulated an influx of southern farmers and settlers whose job it was to secure the sovereignty of the state (Sörlin, 2019). At the time, state power was still predominantly based on territorial control and largely conceived of as legitimized through an *agro-colonial regime* of extractivism.

In a more recent period, gradually emerging during the twentieth century, the demographic, territorial, and agricultural missions associated with resource extraction have weakened. The decoupling of the mining site from the use of its content became more pronounced, a tendency that has only been reinforced and is now almost complete. We may think of this period from ca. 1900 as an *extractive colonial regime*. It rested on global markets and commodities as the default logic. It required southern investment, risk sharing between state and private capital,

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state intervention and support, but also a massive input of technology to save dependency of expensive, hard to find labor. This regime made its way into all Arctic countries, in Russia, North America, Fennoscandia, Svalbard, and Greenland, albeit at different pace and with different political solutions.

The shift was not absolute and instant, rather it was gradual. For example, government support for opening up new land for cultivation in the north of Sweden remained until the 1950s, but, in reality, it had not been very important for several decades prior to that point. The new regime was legitimized, just like the agro-colonial, by a "rhetoric of emptiness" (Stuhl, 2016; Lien, 2021), arguing for an opening for extractive industries in regions defined as "empty," as lacking people, whereas in the past colonialism was a way to put people there to fill the dangerous void.

Debating Extractivism

In recent decades, the growing realization of the negative social, economic, and environmental effects, along with growing resistance from Arctic communities, has spurred critical debate on extractivism's uneven benefits and consequences. Controversies have followed extractive activities in the Arctic from the very start, but they have grown in intensity and tend to shift the balance of public opinion and policy more profoundly than in the past. Against the historical backdrop of stop and start Arctic extractivism and its predominantly instrumental, interest-driven use of natural resources, is it at all possible to think of sustainable development? The kind of development that meets the needs of the present generation without compromising the wishes and interests of future generations?

What is it that needs to be fulfilled or transformed for sustainability to seem realistic or at least unsustainability to be ruled out or minimized? The very nature of the Arctic economy under capitalism makes the goal of sustainability difficult to achieve. For many local communities, visions for the future tend to center on a good quality of life, meaningful and stable employment, and opportunities for young people in situ. At a more general level, Arctic economies share a number of distinct features that challenge sustainability, such as remoteness, a narrow natural resource base, external decision-making, changes in governance structure, demographics, environment, and climate. Smaller local communities, urban centers, and industrialized cities in the North all feel the impacts of increased global connections, which have now become key forces in shaping the path of socio-economic development in the region (Larsen & Fondahl, 2014). The strength and increased importance of these connections, as manifested in the ever-growing force of globalization and the expanding economic integration across market and non-market economies, has meant a direct transmittal of global market volatility to the North, particularly in resource-based economies. Economic consequences are

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many and include impacts on employment and economic opportunities, distribution of income and wealth, traditional livelihoods, and environmental costs.

The net effects of regional investments in resource extraction in the Arctic may be limited when income, profits, and rents leak out of the region in cases where ownership and control over resource use are located elsewhere. The solution is to find better ways to capture and manage resource wealth and to ensure that it is invested for lasting benefits in support of local and regional and economic development (Duhaime, 2004; Bone, 2009). Extractivism is viewed by many Arctic residents as undesirable or a risky venture. The reasons are many: negative net-benefits related to sunk costs, the "resource curse" phenomenon (loss of activity in other sectors after a major growth in a single sector such as extractives), local economic leakages, the dependence on external labor and other capital, the lack of inclusion of locals, and, not least, environmental and human health impacts (Larsen & Huskey, 2020).

This skeptical attitude is corroborated by observations made in economic and social research in many parts of the Arctic. In his work on hinterland economic conditions, David Leadbeater (2009) argued that conditions have changed fundamentally and adversely since the 1970s, particularly in single-industry mining communities. This has led to a "new crisis of hinterland economic development" (Leadbeater, 2009: 90), where population shrinkage is tied to the fact that gains of productivity are being exported, and mining communities and labor are receiving diminished benefits from resource development (Lawrie, Tonts, & Plummer, 2011; Markey et al., 2019; Carson, Nilsson, & Carson, 2020). A redistribution of power toward communities and labor with community mobilization is needed to mitigate and counteract this trend, Leadbeater argued. Likewise, case studies conducted in Scandinavia, Northwest Russia, and Greenland showed considerable skepticism toward the intent behind and consequences of incentives to mine in Arctic locales by capital and political interests from elsewhere (Dale et al., 2018). A frequent suggestion to remedy this shortage of local influence on the emerging resource economy has been the implementation of legislation and governance structures, including clear principles and guidance on public consultations and social licencing (e.g., Wilson, 2016: 75), although as several chapters of this book demonstrate, it will be far from sufficient.

Using a capitals framework, Brenda Parlee (2015) investigated how the possible symptoms of a resource curse are experienced and managed by Indigenous communities in northern Alberta, Canada, with a focus on the case of the Athabasca oil sands. She found that symptoms of the resource curse are present, with many Indigenous communities suffering disproportionately from resource development, and that social capital is important to sustainable resource development (Parlee, 2015: 434). While potential benefits from resource extraction

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and export to foreign markets of fish, timber, or minerals may include improved utilization of existing factors of production, expanded factor endowments, and economic linkage effects, economic weaknesses from extractivism may result. This can happen when external markets grow slowly or experience downturns, when resource earnings are unstable due to price fluctuations, and when local expectations about diversification around an export base are non-existent or limited. Hence, benefits to local and regional economies may fall far short of expectations, and net-benefits may turn out to be negative when regional economic linkages and multiplier effects are weak or non-existent (Horowitz et al., 2018; Larsen & Huskey, 2020).

Similarly, investigating post-staple downturns in a frontier economy and using a case study of the Yukon economy, Andrey Petrov (2010) presented an analysis of the economic effects of mine closures and post-mine demographic shifts in Yukon Territory, Canada, during the economic crisis of the late 1990s. During this period, its staple economy sharply declined with the closing down of the Faro and Beaver Creek extraction sites (Figure 2.4), and fiscal instability and transfer dependency increased. Based on input–output and demo-economic modeling to simulate direct, indirect, and induced effects of mass mine closures and subsequent population

Figure 2.4 Location map of North America. Drawn by Christian Fohringer.

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change, the study suggests that significant employment losses were experienced in the resource and high-tech and high-salary industries. These industries were those that suffered most from the "post staple syndrome" and were the most favorable for the future of the region. At the same time, service and administrative sector employment grew, and Yukon in a sense became more "welfare dependent" (Petrov, 2010: 39–61, at 41).

In contrast to these, the case of the Red Dog zinc mine in northwestern Alaska provides an example of Indigenous ownership and control in northern resource extraction, and with economic net-benefits accruing to the surrounding communities. The Red Dog mine, located above the Arctic Circle, north of Kotzebue, and by the Chukchi Sea (Figure 2.4), started operating in 1989 and is developed under agreement between a native corporation – the NANA Regional Corporation – owned by the Inupiat of Northwest Alaska, and a resource company, Teck Resources. It has been an important source of employment and income for the predominantly native local community, and a source of revenue for NANA and other Alaska Native corporations. The mine has made significant investments in the local communities, including in education and health. In his analysis of the unique relationship between the mine and the region, Bob Loeffler (2015) evaluated the Red Dog mine's effects on eleven remote, predominantly Inupiat Native communities in terms of jobs and income, governance, education, and subsistence activities. He found that significant positive community effects can be attributed to institutional relationships between organizations within the region, and to goals, strategies, and leadership. A direct result of the high local hire rate and benefit sharing with native corporations throughout Alaska has been an increase in economic and employment opportunities locally (Loeffler, 2015: 30).

The case of the Red Dog mine is an example of positive net-benefits to locals. However, the frequent lack of real benefits to local residents from resource extraction has fueled a keen interest in finding robust and sustainable alternatives, such as other land-based trades, knowledge and the creative economy, tourism, and agriculture. While increasingly viewed as a good alternative, and in some cases an industry that may coexist with mineral extraction, the question can be raised whether tourism may itself slowly transform into another form of extractivism (Sokolíčková & Eriksen, 2023, see Chapter 3). Tourism can have significant negative impacts, as illustrated by the fast-growing tourism sector in Iceland. Smaller local communities may receive few benefits relative to costs when cruise ships arrive, and the local area is quickly flooded by large numbers of tourists. Nevertheless, in Iceland tourism has contributed to economic recovery and stabilization following the economic crisis and the financial sector collapse in 2008, although challenges remain, including effects on the housing market, prices, and the environment (e.g., Wade & Sigurgeirsdottir, 2012; Iceland Chamber of

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Commerce, 2017; Larsen & Huskey, 2020). Tourism has also been a successful non-resource dependent alternative in other parts of the Arctic.

The economic future of the Arctic continues to depend on the direction of economic and global change processes and the ability to mitigate the negative effect of resource supply shocks, changes in world prices, and the general economic volatility associated with the limited economic diversification that characterizes many local and regional economies (Larsen, 2004a, 2004b, 2010). The Covid-19 pandemic has also demonstrated that growing sectors such as tourism are no panacea for a stable local economy. Like a sudden change in the world price of minerals and the closure of a mine, the flow of tourists can stop at a moment's notice. A sustainable economy, then, is based on diversification around natural resources and ecosystem services and the build-up of a mix of resources, capital, and capacities that enables an internal resilience even in the face of change.

Greenland provides a range of controversies as it grapples with the challenges and contradictions of extractive development in the context of its political economy and national aspirations (Rasmussen & Gjertsen, 2018). Becoming a self-governing part of the Danish Kingdom in 2009, the large Arctic self-governing nation of only 55,000 inhabitants has explored ways of achieving greater economic independence from Denmark, and the possibility of future sovereignty (e.g., Nielsen, 2013; Hansen et al., 2016). Large-scale resource development, especially hydrocarbon exploration, rare earth, uranium, and iron ore mining may offer greater economic independence and a more self-reliant economy (Andersen, 2015; Wilson, 2016; Bjørst, 2017; Poppel, 2018; Trump, Kadenic, & Linkov, 2018). For Greenland, as for other parts of the Arctic, the benefits of resource production for residents depend on their participation as owners of capital or as labor and the share of government revenues flowing to the region. Because Arctic resource production is often a net importer of capital, labor, and technology – as it has been for most of Arctic history – income produced locally will flow out of the region to pay for these imported factors of production (Larsen & Huskey, 2015). This is also descriptive of the relationship between Greenland and Denmark, and as Greenland remains dependent on annual transfers from Denmark (the block grant), the question remains at what cost greater independence can be achieved.

The proposed rare earth and uranium project (Kvanefjeldet) in Narsaq, Kujalleq municipality (Figure 2.1), now officially voted to not proceed, is a case in point. During the construction, operation, and closure phases of the proposed project, obligatory social and environmental impact assessments (SIA and EIA) were performed, and they showed that economic opportunities would include both earnings and labor directly created by the mine and indirect activities supporting the extraction (Greenland Minerals A/R, 2020). According to the impact assessments, potential benefits for Greenland would include huge capital

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investment, corporate taxes, royalties, and direct labor income tax as well as increased employment (direct and indirect). At the same time, the mine would run the risk of creating inequitable benefits across society, with potential risks that included concerns over the distribution of mineral revenue at a national and regional level. As a result of a shortage of skills nationally, only a proportion of local jobs were expected to be filled by Greenlandic labor. A mining project of this scale and nature also has the potential to impact the livelihoods of households which derive an income from the land as a result of a combination of the physical footprint, and environmental impacts generated. Land-based livelihoods in the local area include: farming (cattle, sheep and reindeer), gemstone collection (*tugtupit*) on the Kvanefjeld plateau, and tourism activities using Narsap Ilua (Greenland Minerals A/S, 2020).

In 2021 a new government was elected that opposes the Kvanefjeld mining project, and a bill was soon drafted to ban uranium mining. Public hearings were held in various locations in South Greenland in September 2021 despite these developments and the local resistance to the project. In and around the same period, the chief executive of the mining company argued that the company still held the "valid right to pursue an exploitation license for the project in compliance with Greenland laws," and a potential lawsuit against Greenland may be filed. Concerns about such a lawsuit and how it could hurt future opportunities to attract foreign investors to the mining sector were expressed by some Greenlanders. In early November 2021 the Government of Greenland voted to ban uranium mining and exploration, thereby blocking further development of the Kvanefjeld project. In the time leading up to this ban locals had expressed their concerns over their voice losing strength in the debate, but many remained united in their stance: "We will all leave Narsaq if the mine goes ahead"; "Nobody will buy our fish, or meat of our cattle and sheep, or come as tourists" (Larsen & Ingimundarson, 2023).

In contrast to Kvanefjeldet, in the case of the Nanulaq gold mine in Nanortalik further south in the municipality of Kujalleq, and scheduled to start operating in 2022, community support has been generally positive. The mine is expected to provide a significant number of jobs to locals with steady employment in transportation services and mining. However, asked about the overall economic impact for the town of Nanortalik located about 35 kilometers from the mining site – a town that has been largely in decline and stagnation since the late 1980s – some locals, while generally positive, also point to abiding concerns. They talk, for example, about the 2009 municipality amalgamation and the subsequent reduced control over resource revenue, hence a more wait and see frame of mind (Larsen & Ingimundarson, 2023).

While mining development in Greenland represents a key source of potential income, important questions arise about ensuring that economic gains of this

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development accrue to the people of Greenland. Demands for more equitable distributions of income and wealth remain pertinent, as is the prospect of mining being integrated into narratives of hope and future for the fledgling nation, as it moves on to possible independence (Sejersen, 2021; Thisted, 2021). Mining activities, oil exploration, and large-scale industrial development plans have provoked political and social debates within Greenland for decades. These debates concern the nature of such development for society and environment. It is about the absence (so far) of appropriate forms of public participation and consultation, decision-making, and regulatory processes, as well as the impacts of extractive industries on hunting and fishing, the shortcomings of social and environmental impact assessments, and the possible influx of thousands of foreigners to work in the construction and operational phases of megaprojects (Nuttall, 2012, 2013).

Conclusion: Legacies and Trajectories of Extractivism

In this chapter we have claimed that extractivism has been a predominant mentality and modus operandi in the Arctic. Extractivism has deep roots in modern Western thought and has grown and consolidated into an ideology of resource extraction over centuries. In practice, extractivism has become more elaborate and technologically sophisticated, but it has not in any comprehensive way diminished, despite critique, especially in the last fifty years. We have also argued that it mutates and extends beyond traditional resources. Extractivism is an amalgamation of ideology, epistemic habit, and material practice in combination with economic, institutional, and legal arrangements. An essential part of it is the taken for granted right of way for extractive projects, regardless of whether they bring much of value to the place where the resources are extracted, their communities, and their more-than-human co-species.

Arctic extractivism has not grown in a vacuum. States, geopolitical actors, companies, and, with time, emerging local and regional interests have advocated it and helped it grow (Figure 2.5). Economic and political ideas have become part and parcel of extractivism, including modernizing development theories and, more recently, neoliberal globalization theory. The latter has helped liberalize extraction as market-based projects rather than projects of regional or national development, thus deepening the exogenous/instrumentalist character of extractivism. Exogenous control is also characteristic of the global networks of capital, technology, trade, and markets, captured by the planetary mine metaphor (Arboleda, 2020; Sörlin, 2023: see Chapter 1). These developments stand in sharp contrast to a more endogenous/sustainable approach that has been advocated by critics of extractivism.

While this is the overall pattern of Arctic extraction, several important qualifications remain. To begin with, the pattern is not universal. There seems to be a differentiation related to the remoteness and accessibility of the mining sites

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Figure 2.5 Was the Atomic Bomb Arctic? Arctic minerals had global connections, here illustrated by uranium from the Port Radium Mine, in Canada's Northwest Territories that supplied the Manhattan Project during the Second World War. Photo: NWT Archives photo N-1979-052: 4877.

and the size and numbers of existing communities, particularly where agriculture has been involved. Northern Fennoscandia, parts of northwestern Russia and Iceland in this regard tend to have experienced a comparatively less extreme version of extractivism, with more focus on community development and an integration of extractive projects with colonization and welfare state goals. The early and more comprehensive agro-colonial approach to the north in Fennoscandia is an underlying cause of the distinctly more integrated and larger communities that formed in the European north compared to other Arctic states. In the latter, significant settler communities came later, and their demographic density has remained low and with more vulnerability (showed in this book in e.g., Malmgren et al., 2023; see Chapter 11). The relatively successful population and colonization politics for the north in all three Fennoscandian countries led to strong national integration of the northern parts of Norway, Sweden, and Finland, as well as in Iceland, which in turn provided a sense of cohesion and equality of life expectations and welfare. Still today, on most social and public health indicators, Fennoscandian Arctic populations stand out with very favorable data, including Indigenous groups with social and health indicators more like the average in these countries and also more favorable than those in Greenland and Arctic North America (Larsen & Fondahl, 2014).

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This prompts the question: Is extractivism so prevalent in the Arctic precisely because of its low population density, remoteness, and isolation? The fact that it seems poised to remain demographically thin, despite earlier visions (Stefansson, 1922) and despite more recent speculations of a cold "new North" serving as a refuge for an overheating planet (Emmerson, 2011; Smith, 2011, discussed in Sörlin, 2018), both by and large futile, suggests that this general situation will likely remain. Does that mean that Arctic extractivism will continue, even in a world where it becomes increasingly untenable where human settlement is more widespread, cities bigger, and alternative low-carbon futures more urgently required? We don't know. It is certainly possible. The fossil fuel-driven world as we know it is still with us, but increasingly questioned and partly curtailed. Peak oil, a concept coined in 1947 by Marion King Hubbert (Priest, 2014; Warde, Robin & Sörlin, 2018), was passed in 2006 according to the International Energy Agency, and the IEA more recently have been vocal in their support for the switch to renewable energy sources. Although predictions are contradictory it has seemed likely for considerable time that the decline will be propelled by the global concerns over climate change rather than any absolute scarcity of fossil fuels (Deffeyes, 2005). Coal consumption and production are already taking a downturn in many parts of the world, led by global ambitions to curb climate change and reach the UN Sustainable Development Goals, although the pace of progress is deeply uncertain.

The world is at a crossroads. While Russia shows no sign of tempering its fossil fuel and mineral extraction, the prospect of, at least, slowing down extractive development in the Arctic is, finally, on the political agenda in Norway following the 2021 election, and coal extraction has all but ended in Svalbard. Expansion of extraction into the Arctic offshore has largely failed, mainly on economic and logistical terms. The extreme liberalization of the Trump administration for natural resource extraction in Alaska has been rolled back by US President Biden, although by and large resource extraction continues unabated on the North Slope, if not at the speed that was projected only a decade ago. As for rare earth elements, this development has only just started and is now propelled by decarbonization efforts. The Arctic is already figuring hugely in the race for extraction sites. Natural Resources Canada officially released the federal government's "Critical Minerals List" during the virtual Prospectors & Developers Association of Canada's (PDAC) 2021 Convention. Accompanied by endorsements from mining industry leaders and at least one Indigenous business development organization, this list identified thirty-one minerals with a capacity to be produced in Canada, which are considered cornerstones of the transition to a green, low-emissions economy. In formulating this list, Canada joined the EU and United States in linking mining to a green discourse framing minerals as central to global energy

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transitions and climate mitigation – as well as domestic economic priorities (Natural Resources Canada, 2021).

Extractivism as "business as usual" may, at the end of the day, serve as an excuse to leave the Arctic in a position to remain one of the (ever fewer) parts of the planet where the remaining dirty extraction work can take place – largely out of sight of global public scrutiny. This suggests that the Arctic – already a place with a very high density of unsustainable activities – may be even worse off. When the rest of the world transforms and grows greener during this century, hopefully responding finally to the urgent challenge of climate change and reducing carbon and environmental footprints, the Arctic may be relegated to the position of planetary dump and dirt-hole, in company with Saudi Arabia, Libya, and remote parts of authoritarian states (China, Russia) and the global South. Perhaps not too far off from the extractivist role it already played, but in comparison worse when the rest of the world moves in another direction.

Extractivism in a world of transformation may also mean – indeed already means – that seemingly non-extractive activities form growing parts of the Arctic economy and while doing so take on extractivist features. Tourism, adventure travel, events such as sports, and other "experience" oriented activities but also science and education, learning of environmental and climate change in situ, and getting close to local communities – all of these and possibly many others may play out in the Arctic in ways that they do not in more populated areas. Indeed, we might say that there has been a long history of outsiders harvesting the Arctic aesthetically, imaginatively, and visually, and this has had and continues to have ramifications for extractivist logics.

The question naturally arises whether sustainability and improvements in quality of life in the north are derived best from gearing resources toward industrial development, or alternatively, from investing in the small-scale economic development of local communities. This would involve local participation and decision-making, and benefits that accrue more directly to local stakeholders, with economic leakages to outside markets and economic interests minimized. As an alternative to extractivism there is an increasing body of literature that argues for the development of more economic diversification of local and regional economies, with non-extractive alternatives, including the implementation of legislation to help protect the interests of local communities.

Now, well into the twenty-first century, we see not so much a "new Arctic" but an Arctic that is struggling to find its way under increasing and multiple pressures and a legacy of extractivism that will certainly be a continued force to reckon with. New and alternative trajectories cannot easily be sketched without taking account of this wide-ranging and volumetric presence.

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References

Abrahamsson, T. (2009). *Drömmar av silver: Silververket i Kvikkjokk 1660–1702*. Värnamo: Fälth & Hässler.

Adcock [published as: Sawchuck], T. (2008). An Arctic republic of letters in early twentieth-century Canada. *Nordlit*, 23(2008), 273–292.

Andersen, T. M. (2015). *The Greenlandic Economy: Structure and Prospects. Economics Working Papers 2015:14*. Aarhus: Department of Economics and Business Economics, Aarhus University.

Arctic Centre. (2021). Basic information about the Arctic. Website. www.arcticcentre.org/EN/arcticregion

Avango, D., Högselius, P., and Nilsson, D. (2018). Swedish explorers, in-situ knowledge, and resource-based business in the Age of Empire. *Scandinavian Journal of History*, 43(3), 324–347. https://doi.org/10.1080/03468755.2017.1380923

Avango, D., Nilsson, A. E., and Roberts, P. (2013). Assessing arctic futures: Voices, resources and governance. *The Polar Journal*, 3(2), 431–446. https://doi.org/10.1080/2154896X.2013.790197

Awebro, K. (1983). *Luleå silververk: Ett norrländskt silververks historia*. Luleå: Norrbottens museum.

Bjørst, L. R. (2017). Uranium: The road to "economic self-sustainability for Greenland"? Changing Uranium-positions in Greenlandic politics. In G. Fondahl and G. N. Wilson, eds., *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Cham: Springer Nature, pp. 25–34. https://doi.org/10.1007/978-3-319-46150-2_3

Bjørst L. R., Sejersen, F., and Thisted, K. (2023). Affective approaches: Rethinking emotions in resource extraction. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Blomström, M. and Hettne, B. (1984). *Development Theory in Transition: The Dependency Debate and beyond: Third World Responses*. London: Zed Books.

Bone, R. (2009). Environmental impact of resource projects. In R. Bone, ed., *The Canadian North: Issues and Challenges*, 3rd ed., Don Mills, ON: Oxford University Press. pp. 199–232.

Bridge, G. (2009). Material Worlds: Natural resources, resource geography and the material economy. *Geography Compass*, 3(3), 1217–1244. https://doi.org/10.1111/j.1749-8198.2009.00233.x

Broberg, G. and Roll-Hansen, N. (1996). *Eugenics and the Welfare State*. East Lansing: Michigan State University Press.

Bromé, J. (1923). *Nasafjäll: Ett norrländskt silververks historia*. Stockholm: Nordiska bokhandeln.

Calvert, P. (2001). Internal colonisation, development and environment. *Third World Quarterly*, 22(1), 51–63. https://doi.org/10.1080/713701137

Carson, D. B., Nilsson, L. M., and Carson, D. A. (2020). The mining resource cycle and settlement demography in Malå, Northern Sweden. *Polar Record*, 56(e10), 1–13. https://doi.org/10.1017/S0032247420000200

Chaloult, N. and Chaloult, Y. (1979). The internal colonialism concept: Methodological considerations. *Social and Economic Studies*, 28(4), 85–99. www.jstor.org/stable/27861779

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Childs, J. (2016). Geography and resource nationalism: A critical review and reframing. *Extractive Resources and Society*, 3(2), 539–546. https://doi.org/10.1016/j.exis.2016.02.006
Coates, K. (2018). The history and historiography of natural resource development in the Arctic: The state of the literature. In C. Southcott, F. Abele, D. Natcher, and B. Parlee, eds., *Resources and Sustainable Development in the Arctic*. London: Routledge. https://doi.org/10.4324/9781351019101
Dale, B., Bay-Larsen, I., and Skorstad, B., eds. (2018). *The Will to Drill: Mining in Arctic Communities*. Springer Polar Series. https://doi.org/10.1007/978-3-319-62610-9
De Gregori, T. (1987). Resources are not, they become: An institutional theory. *Journal of Economic Issues*, 21(3), 1241–1263. https://doi.org/10.1080/00213624.1987.11504702
Deffeyes, K. S. (2005). *Beyond Oil: The View from Hubbert's Peak*. New York: Hill and Wang.
Demuth, B. (2019). *Floating Coast: An Environmental History of the Bering Strait*. New York: W.W. Norton.
Dodds. K. (2021). Geopolitics and ice humanities: Elemental, metaphorical and volumetric reverberations. *Geopolitics*, 26(4), 1121–1149, https://doi.org/10.1080/14650045.2019.1697240
Doel, R. E., Harper, K. C., and Heymann, M., eds. (2016). *Exploring Greenland: Cold War Science and Technology on Ice*. New York: Palgrave.
Drayton, R. (2000). *Nature's Government: Science, Imperial Britain, and the "Improvement" of the World*. New Haven, CT: Yale University Press.
Drivenes, E-A. (1985). *Fiskarbonde og gruveslusk*. Oslo: Universitetsforlaget. www.nb.no/items/7ee36ea73b68018c325bf1602b8a0945?page=5
Duhaime, G. (2004). Economic systems. In J. N. Larsen and A. Nilsson, eds., *Arctic Human Development Report*. Reykjavik: Stefansson Arctic Institute, pp. 69–84. https://oaarchive.arctic-council.org/handle/11374/51
Duhaime, G. and Caron, A. (2009). Economic and social conditions of Arctic regions. In S. Glomsrød and I. Aslaksen, eds., *The Economy of the North 2008*. Oslo: Statistics Norway, pp. 11–26. https://oaarchive.arctic-council.org/handle/11374/35
Elberling, B., Asmund, G., Kunzendorf, H., and Krogstad, E. J. (2002). Geochemical trends in metal-contaminated fiord sediments near a former lead–zinc mine in West Greenland. *Applied Geochemistry* 17(4): 493–502. https://doi.org/10.1016/S0883–2927(01)00119-6
Emmerson, Charles. (2011). *The Future History of the Arctic: How Climate, Resources and Geopolitics Are Reshaping the North, and Why it Matters to the World*. London: Vintage Books.
Fondahl, G. and Wilson, G. N., eds. (2017). *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Cham: Springer Nature.
Fur, G. (2013). Colonialism and Swedish history: Unthinkable connections? In M. Naum and J. M. Nordin, eds., *Scandinavian Colonialism and the Rise of Modernity: Small Time Agents in a Global Arena*. New York: Springer, pp. 17–36.
Fur, G. and Hennessey, J. (2020). Introduktion: Svensk kolonialism, Sverige och kolonialism eller svenskar och kolonialism? *Historisk Tidskrift*, 140(4), 375–384.
Gascoigne, J. (1998). *Science in the Service of Empire: Joseph Banks, the British State and the Uses of Science in the Age of Revolution*. New York: Cambridge University Press.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Gaski, H. (1993). The Sami people: The 'White Indians' of Scandinavia. *American Indian Culture and Research Journal*, 17, 115–128. https://doi.org/10.17953/aicr.17.1.6427j6g14h536v13
Gilberthorpe, E. and Hilson, G., eds. (2014). *Natural Resource Extraction and Indigenous Livelihoods: Development Challenges in an Era of Globalisation*. Farnham: Ashgate.
Greenblatt, S. (1991). *Marvelous Possessions: The Wonders of the New World*. Chicago: The University of Chicago Press.
Greenland Minerals A/S. (2020). Kvanefjeld Project. Social Impact Assessment. Online report. https://naalakkersuisut.gl/~/media/Nanoq/Files/Hearings/2020/1812_kuannersuit/Documents/SIA%20ENG.pdf
Guilherme, A. (2011). Metaphysics as a basis for deep ecology: An enquiry into Spinoza's system. *The Trumpeter* 27(3): 60–78.
Hansen, A. M., Vanclay, F., Croal, P., and Skjervedal, A. S. H. (2016). Managing the social impacts of the rapidly-expanding extractive industries in Greenland. *Extractive Industries and Society*, 3, 25–33. https://doi.org/10.1016/j.exis.2015.11.013
Hansson, S. (2006). Technology and social change: A technological megasystem in the north of Sweden. In L. Elenius, ed., *Migration, Industrialisation and Regionalisation*. Luleå: Luleå University of Technology, pp. 20–31.
Hays, S. P. (1959). *Conservation and The Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920*. Cambridge, MA: Harvard University Press.
Hobson, J. A. (1902). *Imperialism: A Study*. London: James Nisbet.
Horowitz, L. S., Keeling, A., Lévesque, F., Rodon, T., Schott, S., and Thériault, S. (2018). Indigenous peoples' relationships to large-scale mining in post/colonial contexts: Toward multidisciplinary comparative perspectives. *Extractive Industries and Society*, 5(3), 404–414. https://doi.org/10.1016/j.exis.2018.05.004
Iceland Chamber of Commerce. (2017). *The Icelandic Economy. Current State, Recent Developments and Future Outlook*, 19th ed., Reykjavik.
Jaklin, A. (2006). *Historien om Nord-Norge*. Oslo: Gyldendal.
Josephson, P. (2014). *The Conquest of the Russian Arctic*. Cambridge, MA: Harvard University Press.
Kanger, L., Tinits, P., Pahker, A.-K., Orru, K., Tivari, A. K., Sillak, S., Šeļa, A., and Vaik, K. (2022). Deep transitions: Towards a comprehensive framework for mapping major continuities and ruptures in industrial modernity. *Global Environmental Change*, 72, 102447. https://doi.org/10.1016/j.gloenvcha.2021.102447
Keeling, A. and Sandlos, J. (2009). Environmental justice goes underground? Historical notes from Canada's northern mining frontier. *Environmental Justice*, 2(3), 117–125. https://doi.org/10.1089/env.2009.0009
Keeling, A. and Sandlos, J., eds. (2015). *Mining and Communities in Northern Canada: History, Politics, and Memory*. Calgary: University of Calgary Press.
Kidd, B. (1898). *The Control of the Tropics*. London: Macmillan.
Knudsen, H., Keeling, A., and Sandlos, J. (2022). Mining and colonialism in the circumpolar North. In P. Roberts and A. Howkins, eds., *Cambridge History of the Polar Regions*. Cambridge: Cambridge University Press. pp. 430–461.
Koerner, L. (1999). *Linnaeus: Nature and Nation*. Cambridge, MA: Harvard University Press.
Kuokkanen, R. (2019). At the intersection of Arctic indigenous governance and extractive industries: A survey of three cases. *The Extractive Industries and Society*, 6(1), 15–21. https://doi.org/10.1016/j.exis.2018.08.011
Larsen, J. N. (2004a). External dependency in Greenland: Implications for growth and instability. In J. H. Ingimundarson and A. Golovnov, eds., *Northern Veche:*

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Proceedings of the Second Northern Research Forum. Veliky Novgorod, Russia. 19–22 September 2002. Reykjavik: Stefansson Arctic Institute.
Larsen, J. N. (2004b). Trade dependency and export-led growth in an Arctic economy: Greenland, 1955–1998. In J. Oakes, ed., *Native Voices in Research*. Winnipeg: Aboriginal Issues Press. pp. 327–337.
Larsen, J. N. (2010). Climate change, natural resource dependency, and supply shocks: The case of Greenland. In Gorm Winther. ed., *Political Economy of Northern Regional Development*. Vol. 1. TemaNord 2010:521. Copenhagen: Nordic Council of Ministers. pp. 205–218.
Larsen, J. N. and Fondahl, G., eds. (2014). *Arctic Human Development Report: Regional Processes and Global Linkages*. Copenhagen: Nordic Council of Ministers.
Larsen, J. N. and Ingimundarson, J. H. (2023). Overarching issues of justice in the Arctic: Reflections from the case of South Greenland. In C. Wood-Donnelly and J. Ohlsson, eds., *Arctic Justice: Environment, Society & Governance*. Bristol: Bristol University Press.
Larsen, J. N. and Huskey, L. (2015). The Arctic economy in a global context. In B. Evengard, J. N. Larsen, and Ø. Paasche, eds., *The New Arctic*. London: Springer. pp. 159–174.
Larsen, J. N. and Huskey, L. (2020). Sustainable economies in the Arctic. In A. Petrov and J. Graybill, eds., *Arctic Sustainability Key Methodologies and Knowledge Domains: A Synthesis of Knowledge*. Abingdon and New York: Routledge. pp. 33–42.
Lawrie, M., Tonts, M., and Plummer, P. (2011). Boomtowns, resource dependence and socio-economic well-being. *Australian Geographer*, 42 (2), 139–164. https://doi.org/10.1080/00049182.2011.569985
Leach, M., Scoones, I., and Stirling, A. (2010). *Dynamic Sustainabilities: Technology, Environment, Social Justice*. London: Earthscan.
Leadbeater, D. (2009). Single-industry resource communities, 'shrinking,' and the new crisis of hinterland economic development. In K. Pallagst et al., eds., *The Future of Shrinking Cities: Problems, Patterns and Strategies of Urban Transformation in a Global Context*. Berkeley, CA: Institute of Urban and Regional Planning, UC Berkeley. pp. 89–100.
Lien, M. E. (2021). Interruptions: Affective futures and uncanny presences at Giemaš, Finnmark. *Polar Record*, 57(e1), 1–9. https://doi.org/10.1017/S0032247420000443
Lien, M. E. (2023). Beyond mining: Repair and reconciliation. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Loeffler, B. (2015). Mining and sustainable communities: A case study of the Red Dog mine. *Economic Development Journal*, 14 (2), 23–31. https://scholarworks.alaska.edu/handle/11122/9571
Magnusson, L. (2015). *The Political Economy of Mercantilism*. Abingdon: Routledge.
Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition: Arctic legacies. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Markey, S., Halseth, G., Argent, N., Boron, J., and Ryser, L. (2019). Bending the arc of the staples trap: Negotiating rural resource revenues in an age of policy incoherence. *Journal of Rural Studies*, 67, 25–36. https://doi.org/10.1016/j.jrurstud.2019.02.002
McCannon, J. (2012). *A History of the Arctic: Nature, Exploration and Exploitation*. London: Reaktion Books.

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Merchant, C. (1980). *The Death of Nature: Women, Ecology, and the Scientific Revolution*. New York: Harper & Row.
Mercon, J. (2011). Environmental ethics and Spinoza's critique of anthropocentrism. *ETHICA*, 18(2), 161–173. www.uv.mx/personal/jmercon/files/2011/08/Ethica_GamaFilho.pdf
Minde, H. (2003). Assimilation of the Sami: Implementation and consequences. *Acta Borealia*, 20(2), 121–146. https://doi.org/10.1080/08003830310002877.
Munck, R. and O'Hearn, D. (1999). *Critical Development Theory: Contributions to a New Paradigm*. London: Zed Books.
Natural Resources Canada. (2021). Critical minerals. *Website*. www.nrcan.gc.ca/our-natural-resources/minerals-mining/critical-minerals/23414
Naum, M. and Nordin, J. M., eds. (2013). *Scandinavian Colonialism and the Rise of Modernity: Small Time Agents in a Global Arena*. New York: Springer.
Nielsen, S. B. (2013). *Exploitation of Natural Resources and the Public Sector in Greenland. Background Paper for the Committee for Greenlandic Mineral Resources to the Benefit of Society*. Copenhagen: University of Copenhagen. https://research-api.cbs.dk/ws/portalfiles/portal/58811653/Soren_Bo_Nielsen_Exploitation_of_natural_resources_and_the_public_sector_in_Greenland.pdf
Nordin, J. M. and Ojala, C-G. (2015). Mining Sápmi: Colonial histories, Sámi archaeology, and the exploitation of natural resources in Northern Sweden. *Arctic Anthropology*, 52(2), 6–21. https://doi.org/10.3368/aa.52.2.6
Nordin, J. M. and Ojala, C-G. (2020). An industrial revolution in an Indigenous landscape: The copper extraction of the early modern Torne River valley in its global context. *Fennoscandia Archaeologica*, 37, 61–81. www.sarks.fi/fa/PDF/FA_37_Nordin_Ojala.pdf
Nuttall, M (2012). Imagining and governing the Greenlandic resource frontier. *The Polar Journal*, 2(1), 113–124. https://doi.org/10.1080/2154896X.2012.679563
Nuttall, M (2013). Zero-tolerance, uranium and Greenland´s mining future. *The Polar Journal*, 3(2), 101–118. https://doi.org/10.1080/2154896X.2013.868089
Nuttall, M (2017). *Climate and Subsurface Politics in Greenland: Under the Great Ice*. Abingdon: Routledge.
Parlee, B. L. (2015). Avoiding the resource curse: Indigenous communities and Canada's oil sands. *World Development*, 74, 425–436. https://doi.org/10.1016/j.worlddev.2015.03.004
Petrov, A. (2010). Post-staple bust: Modeling economic effects of mine closures and post-mine demographic shifts in an arctic economy (Yukon). *Polar Geography*, 33(1–2), 39–61. https://doi.org/10.1080/1088937X.2010.494850
Pinderhughes, C. (2011). Toward a new theory of internal colonialism. *Socialism and Democracy*, 25, 235–256. https://doi.org/10.1080/08854300.2011.559702
Piper, L. (2009). *The Industrial Transformation of Subarctic Canada*. Vancouver: UBC Press.
Poppel, B. (2018). Arctic oil & gas development: The case of Greenland. In L. Heininen and H. Exner-Pirot, eds., *Arctic Yearbook 2018: Arctic Development in Theory and in Practice*. Akureyri: Northern Research Forum. https://arcticyearbook.com/
Priest, T. (2014). Hubbert's Peak: The great debate over the end of oil. *Historical Studies in the Natural Sciences*, 44(1), 37–79. https://doi.org/10.1525/hsns.2014.44.1.37
Prior, T., Giurco, D., Mudd, G., Mason, L., and Behrisch, J. (2012). Resource depletion, peak minerals and the implications for sustainable resource management. *Global*

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Environmental Change, 22(3), 577–587. https://doi.org/10.1016/j.gloenvcha.2011.08.009

Rasmussen, R. O. (2014). Multi-functionality as scenarios for land use development in the Arctic. In Sustainable Regions – Sustainable Local Communities. R. Weber and R. O. Rasmussen, eds. *Nordregio Working Paper 2014:2*. Stockholm: Nordregio publications. pp. 36–49.

Rasmussen, R. O. and Gjertsen, A. (2018). Sacrifice zones for a sustainable state? Greenlandic mining politics in an era of transition. In B. Dale, B. Skorstad, and I. Bay-Larsen, eds., *The Will to Drill: Mining and Arctic Communities*. London: Springer. pp. 127–151.

Richardson, T. and Weszkalnys, G. (2014). Resource materialities. *Anthropological Quarterly*, 87(1), 5–30.

Robyn, L. M. (1998). *Resource Colonialism and Native Resistance: The Mining Wars in Wisconsin*. Dissertations. 1577. https://scholarworks.wmich.edu/dissertations/1577

Rosenblum, M. (1988). *Mission to Civilize: The French Way*. New York: Anchor Press.

Rossi, M., Forget, M., Gunzburger, Y., Bergeron, K. M., Samper, A., and Camizuli, E. (2021). Trajectories of mining territories: An integrated and interdisciplinary concept to achieve sustainability. *The Extractive Industries and Society*, 8(1), 1–7. https://doi.org/10.1016/j.exis.2021.01.006

Röver, C. (2021). *Making Reindeer: The Negotiation of an Arctic Animal in Modern Swedish Sápmi, 1920-2020*. PhD diss. Stockholm: KTH Royal Institute of Technology. www.diva-portal.org/smash/get/diva2:1553689/FULLTEXT01.pdf

Sejersen, F. (2021). Brokers of hope: Extractive industries and the dynamics of future-making in post-colonial Greenland. *Polar Record*, 56(e22), 1–11. https://doi.org/10.1017/S0032247419000457

Sessions, G. (1977). Spinoza and Jeffers on man in nature. *Inquiry*, 20, 481–528. https://doi.org/10.1080/00201747708601829

Smith, L. C. (2011). *The New North: Our World in 2050*. London: Profile Books.

Sokolíčková, Z. and Eriksen, T. H. (2023). Extraction cultures in Svalbard: From mining coal to mining knowledge and memories. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Sommarin, E. (1908). *Bidrag till kännedom om arbetsförhållanden vid svenska bergverk och bruk i äldre tid fram till omkring år 1720*. Lund: Lund University.

Sörlin, S. (1988). *Framtidslandet: Debatten om Norrland och naturresurserna under det industriella genombrottet, 1870–1920*. Stockholm: Carlsson.

Sörlin, S. (2017). The Arctic Ocean. In D. Armitage, A. O. Bashford and S. Sivasundaram, eds., *Oceanic Histories*. Cambridge: Cambridge University Press, pp. 269–295.

Sörlin, S. (2018). Anthropocene Arctic: Reductionist imaginaries of a 'New North'. In N. Wormbs, ed., *Competing Artic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan, pp. 243–269.

Sörlin, S. (2019). State and resources in the North: From territorial assertion to the '*smorgasbord* state'. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. Abingdon and New York: Routledge, pp. 38–61.

Sörlin, S. (2021). Is there such a thing as 'Best Practice'? Exploring the extraction/sustainability dilemma in the Arctic. In D. C. Nord, ed., *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action*. Cham: Springer Nature, pp. 321–348.

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Sörlin, S. (2023). The extractivist paradigm: Arctic resources and the planetary mine. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Southcott, C., Abele, F., Natcher, D., and Parlee, B., eds. (2018). *Resources and Sustainable Development in the Arctic*. London: Routledge.
Stefansson, V. (1922). *The Northward Course of Empire*. New York: Harcourt Brace.
Stoler, A. L. (2013). *Imperial Debris: On Ruins and Ruination*. Durham, NC: Duke University Press.
Storm, A. (2014). *Post-industrial Landscape Scars*. New York: Palgrave Macmillan.
Stuhl, A. (2016). *Unfreezing the Arctic: Science, Colonialism and the Transformation of Inuit Lands*. Chicago: The University of Chicago Press.
Thisted, K. (2021). Emotions, finances and independence: Uranium as a "happy object" in the Greenlandic debate on secession from Denmark. *Polar Record*, 56(e1), 1–12. https://doi.org/10.1017/S0032247419000433
Trump, B. D., Kadenic, M., and Linkov, I. (2018). A sustainable Arctic: Making hard decisions. *Arctic, Antarctic, and Alpine Research*, 50(1), e1438345. https://doi.org/10.1080/15230430.2018.1438345
Van Alstine, J. and Davies, W. (2017). Understanding Arcticness: Comparing resource frontier narratives in the Arctic and East Africa. In I. Kelman, ed., *Arcticness: Power and Voice from the North*. London: UCL Press, pp.89–101. https://doi.org/10.14324/111.9781787350137
van de Grift, L. (2015). Theories and practices of internal colonization: The cultivation of lands and people in the age of modern territoriality. *International Journal for History, Culture and Modernity*, 3(2): 139–158. http://doi.org/10.18352/hcm.480
Vikström, H., Högselius, P., and Avango, D. (2017). Swedish steel and global resource colonialism: Sandviken's quest for Turkish chromium, 1925–1950. *Scandinavian Economic History Review*, 65(3), 307–325. https://doi.org/10.1080/03585522.2017.1369152
Voyles, T. B. (2015). *Wastelanding: Legacies of Uranium Mining in Navajo Country*. Minneapolis: University of Minnesota Press.
Wade, R. H. and Sigurgeirsdottir, S. (2012). Iceland´s rise, fall, stabilization and beyond. *Cambridge Journal of Economics*, 36(1), 127–144. https://doi.org/10.1093/cje/ber038
Warde, P., Robin, L., and Sörlin, S. (2018). *The Environment: A History of the Idea*. Baltimore, MD: Johns Hopkins University Press.
Wilson, E. (2016). Negotiating uncertainty: Corporate responsibility and Greenland´s energy future. *Energy Research & Social Science*, 16, 69–77. https://doi.org/10.1016/j.erss.2016.03.009
Wilson, E. and Stammler, F. (2016) Beyond extractivism and alternative cosmologies: Arctic communities and extractive industries in uncertain times. *Extractive Industries and Society*, 3(1), 1–8. https://doi.org/10.1016/j.exis.2015.12.001
Wormbs, N., ed. (2018). *Competing Artic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan.
Wrigley, C. (2020). *A Discontinuous Earth: Permafrost Life in The Anthropocene.* PhD diss. London: Queen Mary University.

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3

Extraction Cultures in Svalbard

From Mining Coal to Mining Knowledge and Memories[1]

ZDENKA SOKOLÍČKOVÁ, THOMAS HYLLAND ERIKSEN

Extractive Cultures

The extraction of raw materials has always been a human activity, and even mining of fossil fuels goes back several thousand years. Coalmining may have started in China as early as 3,500 BCE. At the same time, certain periods are more intense than others. The contemporary world of an overheated modernity, characterized by an acceleration of acceleration (Eriksen, 2016; McNeill & Engelke, 2016), finds itself in the middle of such a period, with "resource booms" and "busts" taking place in all continents. New extraction sites are developed, closed mines are being re-opened, foreign investors compete for leases, millions of people are engaged in artisanal small-scale mining from Congo to Peru (Pijpers & Eriksen, 2018), and the global trade in resources such as coal, copper, and iron ore has grown enormously since the turn of the millennium, not least due to China's industrial development and its quest for resources (see, e.g., Brautigam, 2009). In the case of Africa, Bryceson et al. (2014: 3–5) even identify the current "era of mineralisation" as one of the continent's three major mining eras of the twentieth and early twenty-first century, following an era of "apartheid mining in Southern Africa" and of "conflict mineral mining" in diamond-rich countries such as Democratic Republic of Congo, Sierra Leone, and Liberia. As a matter of fact, human extraction and consumption of mineral resources has increased steadily since the European industrial revolution, but never as fast as in the early decades of the present century.

To extract means to draw, take, or copy something out – something one has not produced oneself. Originating in late Latin and gaining its current meaning in the sixteenth and seventeenth century, the term "extraction" describes activities performed at that time just as it does those taking place in the twenty-first century in Svalbard. Recently, critical scholarship has widened the definition of extractivism to "an analytical and also political concept that enables the

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examination and articulation of deeper underlying logics of exploitation and subjectification that are central to the present conjuncture of capitalist globalization and neoliberalism" (Junka-Aikio & Cortes-Severino, 2017: 177). Yet in academic literature where resource extraction is discussed together with the booming industry of tourism (Blanco, 2011; Ruiz-Frau et al., 2015; Sisneros-Kidd et al., 2019), there is often an undisputed distinction made between extractive and non-extractive practices. Following Büscher and Davidov (2016), Byström (2019), Saville (2019b), Stoddart et al. (2020), and Herva, Varnajot, and Pashkevich (2020), we argue for revisiting the issue, and will critically interrogate ideas that view tourism and science as being non-extractive.

Seen in the context of the current expansion of the extractive sector, questions related to unequal economic growth, the local distribution of benefits, development, global commodity chains, taxation, sustainability, livelihood issues, local resistance, and climate change, among others, are becoming more and more pertinent for an understanding of resource extraction's multiple effects. After all, the extractive sector (involving both large-scale industrial as well as small-scale artisanal operations) has the allure, capital, and power to trigger changes across societal domains. It attracts large numbers of people, either searching for employment in industrial operations or engaging in artisanal mining; it requires shifts and generates capital; it may contribute to local economic development through spill-over effects; it brings together a variety of stakeholders with different and sometimes opposing interests; it turns over soil and impacts upon global as well as local socio-economic, political, and ecological systems in sometimes very dramatic ways (see Jacka, 2018; Golub, 2019 for overviews). Due to this characteristic of the extractive sector, the kinds of accelerated change it triggers can often be characterized as balancing acts between bringing about positive development by creating jobs, improving infrastructure or providing national income through taxation, and prompting crisis through land acquisitions and privatization, displacement, exploitation, or environmental destruction (see Kirsch, 2006 for the latter).

In this chapter, we ask some key questions about extractivism. Do mining communities have important characteristics in common? What are the patterns of resource extraction in the Arctic? What is special about the situation in Svalbard? And, finally, to what extent can the concept of extractivism usefully be applied to immaterial activities such as tourism and research? We thus discuss the ambivalent nature and nexus of extractive activities and explore whether it can be said to go beyond oil drilling, coal mining, or the extraction of minerals. Two years of ethnographic fieldwork (2019–2021) in Longyearbyen, Svalbard undertaken by Sokolíčková (in prep.) underpin the hypothesis about an ultimately misleading differentiation between extractive and non-extractive industries.

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The Extractive Boomtown

Mining communities often have an ephemeral existence, created out of nought and flourishing only for as long as the mine is viable, illustrating the most obvious and significant contrast, between extraction and production. They may quickly become ghost towns when the ore is exhausted, since the locality depended on one resource for its viability. Some former mining towns, notably in Australia and the United States, try to reinvent themselves as tourist attractions, some may shift to other sources of livelihood such as farming or manufacturing, while others are just abandoned. Given the demographic composition of many mining communities, which are often dominated by single men or fragile families, the latter option is often chosen, and remote parts of the American West as well as the interior of Australia are strewn with the dilapidated remnants of old mining settlements.

Mining communities are "boomtowns," often only patchily connected to surrounding societies. Even in established cities, such as Gladstone, Queensland (Eriksen, 2018), the influx of more than 5,000 temporary fly-in-fly-out (FIFO) workers in the early 2010s, owing to a major infrastructural project, was unsettling and controversial locally, and their lives had few overlaps with those of settled Gladstonites.

Boomtowns are volatile and socially fragile. In a study carried out at the beginning of the shale oil boom in the Marcellus Shale region in the Appalachians, Jacquet (2009) discusses some of the typical problems experienced by earlier boomtowns. Referring, in particular, to studies carried out in the 1970s and early 1980s of energy resource booms in the western United States, Jacquet mentions some typical disadvantages experienced by boomtowns:

> Some of these disadvantages include a lack of information, growth volatility, lack of jurisdiction, conflict between long-term residents and new residents, resistance to new government policy or planning strategies, shortage of staff or expertise, and a lack of or lag in sufficient revenue. (Jacquet, 2009: 2)

Ironically, Jacquet remarks, many rural communities have been waiting for growth and prosperity for decades, and when development finally comes, there is too much of it, and it comes too fast – almost like the Australian farmer waiting for rain, only to see his fields flooded and his crops destroyed when it finally arrives in copious amounts.

The most famous article about the boomtown syndrome in the United States is probably Eldean Kohrs' controversial report from Gillette, Wyoming (Kohrs, 1974). This article by a psychologist vividly describes a society where the pace of change is uneven, making it impossible for services, infrastructure, housing, and routine family life to keep up with the rapid influx of settlers. Kohrs's article introduced the term "The Gillette Syndrome" in boomtown studies, which has come to refer to social problems ranging from divorce and alcoholism to poor schooling and crime.

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A more systematic approach was represented by John Gilmore (1976), who argued that the inadequacy of services and recreational opportunities along with the high cost of living in the boomtown makes it difficult to attract a permanent population, especially in sectors such as education, health, and shop keeping, which are not themselves part of the boom. This general point is relevant for Longyearbyen, about which more later.

Naturally, it is because of their reliance on a limited resource that many mining boomtowns have a short lifespan. Exceptions include iron mining communities such as Karratha in Western Australia or coal towns such as the cluster of mining towns in Silesia (Allen, 2021), which are nevertheless faced with the new challenge of climate concerns and the drive toward renewables. In the Arctic, to which we turn in the next section, there are several mining communities of considerable longevity, which are demographically less volatile and transient than others, the most famous and economically important being Kiruna in Sweden, where iron ore mining has taken place since around 1900[2] (see Malmgren et al., 2023, see Chapter 11). Others are Kirkenes in Norway, with a similar longevity, while Fermont and Schefferville in northern Quebec have operated since the 1950s/1960s.

The philosopher Jean-Paul Sartre (1977 [1960]: 154) spoke poetically about coal as capital "bequeathed to mankind by other living beings," a gift from plants that had gone extinct many millions of years ago. In principle, this resource is renewable, but one will have to wait at least sixty million years. It is therefore safe to say that humanity is now, in the space of just a few generations, burning off a valuable gift that it has taken the planet a very long time to produce. The extractive logic of one-sided exploitation is starkly and acutely visible in the fragile Arctic biotopes.

Extractivism in the Arctic

An important distinction applies between resources that are slowly but surely being depleted and renewable resources. In the latter case, the relationship is reciprocal, in the former parasitical. In practice, the distinction has not always been useful in the high Arctic, where marine mammals and fish were often the main economic resource before mining. Although fish, seals, and whales reproduce and can be seen as a renewable and thus sustainable resource, they cannot always keep up with harvesting efforts. In the Arctic, whaling booms have in recent history led whale species close to extinction, and worldwide, fish stocks considered sustainable by the Food and Agriculture Organization have decreased from over 90 percent in 1974 to 65 percent in 2017 (FAO, 2018). Unlike the industrial newcomers to the Arctic region, its Indigenous peoples, for example, Inuit groups,

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maintained societies based on sustainable harvesting for millennia, but at a cost: Their societies were different from those enabling professional and institutional differentiation. Life expectancy was rather short, and population sizes were on levels the environment could sustain.

The modern era, especially the decades following the "great acceleration" since 1945 (McNeill & Engelke, 2016), has seen the incursion of extractive industries in Inuit heartlands. As early as the 1980s, the biologist and travel writer Barry Lopez warned about the ecological destruction wrought by oil exploration in Alaska. In the early 2020s, the main political controversy in Greenland concerns a mining concession at Kvanefjeld near the southern tip of the island (Figure 2.1). Characteristically, the disagreement over the Kvanefjeld mine reveals a dilemma: Greenlanders wish to be fully independent of their former colonial power Denmark, which continues to support the country to the tune of 3.9 billion Danish kroner a year (a substantial sum, considering that the total population of the island is 55,000), and the mine would contribute to economic self-sufficiency.

The proposed mine, owned by the Australian company Greenland Minerals (a major issue is made of the fact that a Chinese company owns 11 percent of the shares), will not contribute to climate change. On the contrary, the rare earths deposited in the Kvanefjeld mountain are essential ingredients in non-fossil technology, such as batteries. There is also some uranium, which – while controversial because of the radiation risk – may represent a carbon-neutral alternative to fossil fuels. Moreover, as the shrimp factory in the nearby town Narsaq closed in 2010, creating mass unemployment in the small community, the jobs offered by the mine are attractive.

Against this view, detractors argue that the influx of foreign workers would change the community beyond recognition, that the mine would affect the sheep pastures adversely, in addition to the health risks and environmental degradation entailed in the open pit mine. In the 2021 elections, the anti-mining Community of the People party (*Inuit Ataqatigiit*) narrowly won, and this will for the time being put the mining project on hold. A proposed iron mine further north (the Isua mine), whose concession is owned by London Mining, does not seem to have led to similar controversy. Located 150 kilometers north of the capital Nuuk, this mine would not interfere with community life as the area is uninhabited; on the other hand, the potential climate impact of iron mining is considerable, unlike rare earth mining.

The situation in Alaska is different. Since its opening in 1977, the Prudhoe Bay oil field on its north coast is by far the largest and most productive in North America. There are small Indigenous settlements nearby, but the 3,000 workers employed by oil companies and contractors are FIFOs. Like in Greenland and Svalbard, the environment is ecologically fragile and incapable of supporting large

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populations by way of production. Mines are social bubbles, in this case (as often elsewhere) furnished with an independent electricity supply and recreational facilities for the workers, ranging from gyms to seriously discounted fast-food outlets, usually inaccessible to outsiders.

Mining in the Russian north, which includes major operations, displays several similarities, notably transience and low biodiversity. Yet, Nikel in the Russian north-west, appropriately named for the mineral so generously deposited in the rock nearby, comes across as a town rather than a camp. Like other Russian mining towns, it has settled residents rather than FIFOs, and families instead of single men. Its population peaked at 22,000 inhabitants in 1989, having since declined following the post-Soviet deregulation of the economy.

It is not obvious that mining in the far north should be qualitatively different from mining elsewhere. In the oilfields of the Ecuadorian Amazon, workers are migrants, and the oil production is independent of, and represents a different societal form to, the surrounding Indigenous communities (which are nevertheless adversely affected by the pollution and disruption caused by the oil company; Guzmán-Gallegos, 2019). In much of Australia, a mineral-rich continent and country that obtains much of its foreign revenue through mining, many mining towns are located in otherwise barren and thinly populated areas. Miners are typically FIFOs or DIDOs (drive-in-drive-out) and live in compounds comparable to those found in Alaska, with rosters similar to those of oil workers on North Sea platforms, typically two weeks on and one week off. If much of Western Australia is a hot desert, originally thinly populated by Aboriginal Australians, then much of the Inuit homeland is similarly a cold desert, ecologically incapable of supporting a substantial human population and with a climate most newcomers consider inhospitable.

The kind of complexity introduced by, and integrated with, mining is rarely fully integrated with pre-existing social life, although it should be noted that local people often find employment with the mining companies or offer auxiliary services, for example, in the domains of hospitality and transport. In the Arctic, the gulf between Indigenous ways of living and the societal formation of which mining forms a part can thus be overcome but only patchily and partially. Also, the transience of mining boomtowns in general, and the lack of other sources of economic activity in the Arctic, suggests abandonment when resources are exhausted.

Although not supporting high population densities, many Arctic societies have become part of the modern, globalized world and its networks of exchange and communication. Svalbard was built on coal from the early twentieth century, and mines were opened not only by Norwegians but also by Swedes, Russians, Americans, English, and Scottish (Kruse, 2013). Mining is currently (2021)

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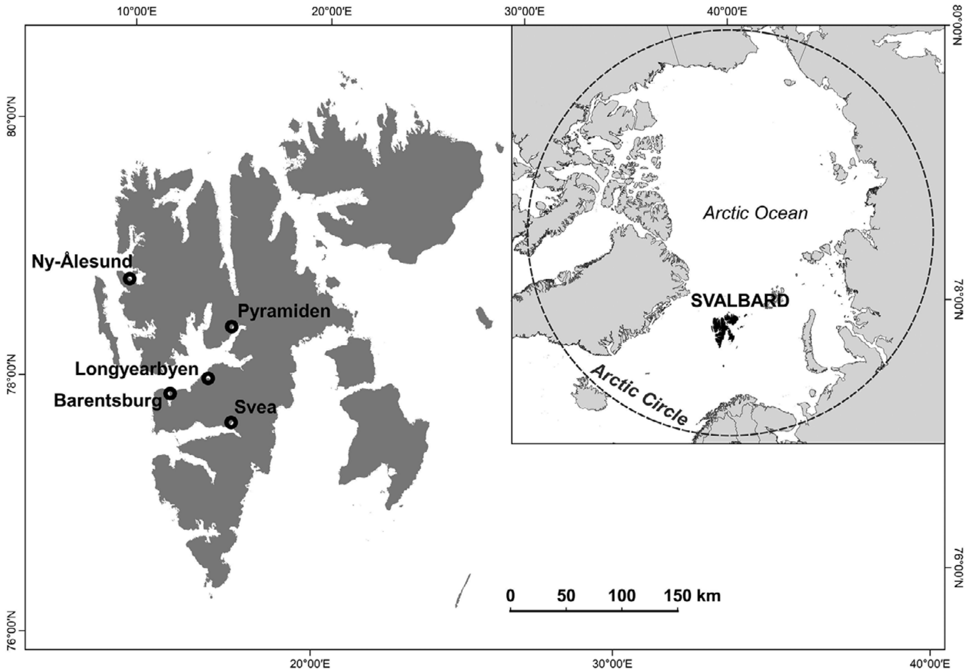

Figure 3.1 Location map of Svalbard. Drawn by Christian Fohringer

coming to an end, at least in the Norwegian-controlled areas, and some of the settlements (such as the Russian mining community Pyramiden and the Norwegian – despite its name – Sveagruva) have been abandoned. Yet, the main town Longyearbyen will probably remain settled after the end of coal extraction, largely owing to its geopolitical significance for Norway and NATO. Tourism is being touted as the new coal, and Norway has also established a small college (*folkehøyskole*) and a large research center in Longyearbyen as well as a research station in the smaller settlement of Ny-Ålesund further north. On the basis of the foregoing discussion of mining towns, the boom-and-bust cycle, and the special characteristics of the Arctic region, we now move to a discussion of the implications of the transition from mining to tourism and research and development (R&D) for Svalbard in general and Longyearbyen in particular, arguing why we see the new industries as kin to coal mining (Figure 3.1).

Extractive Cultures in Svalbard Softening

Svalbard embodies the essence of extraction culture. In other parts of the world, including the Arctic, extraction cultures have developed alongside or in opposition

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to Indigenous lifeways, which often conceptualize the place of humans in nature differently than in "the modern constitution" (Latour, 1993), where there is a crisp and clear boundary separating culture from nature. Svalbard has always been exploited by outsiders (Sörlin et al., 2023, see Chapter 2), taking out resources without giving anything back. As long as the boundaries of the moral universe were those of the human species, this was unproblematic since there was no Indigenous population. Now that the Anthropocene challenges are reshaping intellectual life by decentering humanity even in the human sciences, this practice is becoming increasingly debatable and, in the eyes of many, unacceptable.

During a community dialogue in May 2020, an important figure in local cultural life, a former waitress in the miner's canteen who came to Svalbard in the early 1970s and has lived through the accelerated development of the archipelago, remembered a meeting of representatives for local and central authorities. It was mentioned that "it is a blessing for the Norwegian government that there is no Indigenous population in Svalbard." The perceived blessing lies in the unobstructed ability to rule a vast and strategic territory in the High Arctic where nobody is entitled to claim the right to co-decide on how the place will develop.

Since the end of the sixteenth century, when it was first documented by the Dutch explorer Willem Barents, the formerly distant and unwelcoming archipelago has turned into a warming and easily accessible one owing to fast and comfortable modes of transportation. The hard extractive industry of coal mining is a powerful component of the identity of places such as Longyearbyen, founded in 1906 and currently developing fast both as a science and technology hub, and as a tourist destination, while coal mining is being phased out. Having a tradition spread throughout the last 100 years, the settlement with a transient population had major parts of its short history closely linked to extraction of high-quality black coal, appropriate for use in advanced metallurgical industry but also a convenient local energy source[3]. Some 60 million years ago, when the islands, now known for their barren plains, were damp and forested, large deposits of coal began to form (Dallmann, 2015). In the early twentieth century, it was just to start "emptying the bank," as one of our participants put it.

The point of coal mines in Svalbard was not at times exclusively economic and not always profitable. However, after the Second World War, both the Soviet Union and Norway deliberately invested heavily in the industry, providing them with coal and strengthening their foothold on the territory. Heavily unionized Norwegian coal miners eventually fought for their rights while Norway grew richer thanks to the developing oil industry,[4] and were eventually offered more comfortable housing, better boarding, a wider range of services, and competitive salaries.

In the 1990s, the trend changed in a direction inspired by the new order, in a suddenly unipolar world where Russia was, unlike the Soviet Union, no longer

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perceived as a major threat, and globalization accelerated. There were fewer operating mines, leading to a decreasing Russian population, unlike in Longyearbyen, which started to grow fast and became more diverse and international. The standard of living among the Norwegians went up quickly and so did energy and goods consumption, resulting in increasing amounts of waste and pressure on infrastructure. Air travel has become a simple, cheap, and to many, mundane activity, contributing to speeding up the volume of traffic both by plane and by cruise. After the turn of the millennium, information technologies and social media made the virtual image of Svalbard widely accessible and tempting. People settling in Svalbard could enter without a visa and were allowed to live there while staying connected to family, friends, or employers scattered worldwide, and Longyearbyen grew bigger, denser, and more complex. Following a thread to be found already in a governmental White Paper from the 1970s (Justis- og politidepartementet, 1974–1975), tourism was chosen by the Norwegian government as the new economic backbone of Longyearbyen.

As part of the attempt to make Norway more sustainable, and in line with one of the main goals of the Svalbard Treaty granting Norway sovereignty over the archipelago that environmental protection weighs most (Ulfstein, 1995), coal mining slowly decreased as tourism quickly increased. The two were until recently depicted as two “legs to stand on,” in addition to research and education growing steadily (Norwegian Ministry of Justice and Public Security, 2015–2016). Now coal mining has disappeared from the trio (Figure 3.2), and research and education has been split into two separate tools to foster Norwegian national policy for Svalbard (Hovelsrud, Kaltenborn, & Olsen, 2020).

Tourism is thus being discussed as something to “replace” coal mining, together with R&D in the sphere of renewable energy and technological innovations saleable elsewhere in the Arctic. People are aware that mobility (be it for leisure, for work, or both) is not a new phenomenon on the archipelago (Viken, 2020) and has a longer history than mining coal; with a peculiar mixture of bitterness and fatalism, some local residents comment on the touristic nature of anybody’s stay here. What is interesting in the case of Svalbard is the fact that the narrative about the shift from coal mining to tourism and science presents this change as though the ontological premises on which the industries are built were profoundly different. We argue that there is a continuity from mining to tourism and research.

From a certain perspective, tourism and science are sometimes strikingly commensurable, as Revelin (2013) shows in the case of Swedish Lapland. Her findings about the mining boom appearing almost simultaneously with “pioneer tourism” stimulated by romanticized scientific fascination are well applicable to Svalbard. Byström (2019) shows in another case study from northern Sweden how interrelated resource extraction and tourism are, for example, in terms of labor

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Figure 3.2 Road ahead? The last Norwegian coal mine (Gruve 7) in Adventdalen, closing in 2023. Photo by Jakub Žárský

market processes, or how the infrastructure built to accommodate mining needs also produces access to "pristine wilderness." Büscher and Davidov (2016: 161, 166) even speak about "environmental industries," showing "how the seemingly opposing activities, discourses and political economies of ecological tourism and resource extraction are more intricately entwined than often assumed."

There is a difference between, on the one hand, heavy machinery and determined miners (mostly men) brutally altering the landscape, the seabed, or the inner guts of the mountains, and, on the other hand, a group of tourists carefully landing with a small boat in a mining cultural heritage site to learn about the past and the present from a well-informed guide. The figure of the scientist contemplating in the tundra while counting reindeer, drilling holes in ice to take samples, or interviewing participants also seems distant from the colonial mining engineer. Yet extractivism could continue to be the red thread here, newly directed toward mining knowledge, experience, and memories in an ecosystem where production for human benefit is on the verge of impossible.

In support of this perspective, Saville (2019b: 574) suggests that "[t]he new industries of tourism and research and education represent the 'softer' version of extracting value from Svalbard's natural resources." Stoddart et al. (2020: 8)

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introduce the terms "attractive development" and "experience economy" related to tourism and claim that "the rapid and dramatic impacts of climate change on the Arctic underlie the emergence of a global Arctic as an object of scientific and political concern [and] subject to global scientific inquiry and political debate." Graham (2020) shows how ecologically oriented and publicly funded R&D in Canada relies on the carbon extractive industry and represents "a means of creating and sustaining narratives and a shared outlook in favor of greening the fossil fuel sector as a 'solution' to climate change (as opposed to transitioning away from fossil fuels)." Graham also mentions that "components of ecological science such as conservation and restoration ecology and climatic and atmospheric science, which have grown in the context of the deepening climate crisis, are now also harnessed into carbon extractive development." His "fossil knowledge networks" (Graham, 2020) add substance to the argument about extractivist science. Siri Kalvig, board member of the University Center in Svalbard and administrative director of the state-owned Nysnø Klimainvesteringer AS, published a manifesto for a science of extractivism, painted green and using exclamations such as: "Now a new energy landscape is to be conquered!," "Longyearbyen is conceptualized as a miniature Norway. A simple community consisting of hardworking pioneers of coal mining and knowledgeable researchers," or "Perhaps there is a sort of kinship among the coal miner in the north and oil worker in the west?" (Kalvig, 2021). This recent turn in Svalbard's R&D confirms Stoddart's (2020: 18) findings about "industrial orders of worth – emphasizing scientific and technical innovation and efficiency – [that] are more strongly associated with oil development."

As Midgley (2012) shows in a comparison between mining in Svalbard and Nanisivik, Canada, the extractivist paradigm imposed on the Arctic is entangled with what he calls "geopolitical economy," in the logic of which capital and the state are co-produced simultaneously (Midgley, 2012: 55). Extraction here goes beyond production of "economically valuable commodities but also produces nature, landscapes, states and the like" (Midgley, 2012: 168), as well as – in this case – geopolitical presence (Figure 3.3). Production of scientific knowledge is a further step in the continuum of resource exploitation in the Arctic. In Svalbard, both science and tourism are arenas increasingly controlled by Norwegian authorities. Tighter regulation and a heavier bureaucratic apparatus controlling both tourism and scientific activities is the trend, with clear signals and leadership "from the outside" or "from the south," as laypeople comment. A place where people often feel that their lives serve some larger aims of an economic and geopolitical nature, which is well beyond their control, has constructed its modern history around extractivism.

As Junka-Aikio and Cortes-Severino (2017: 180) note,

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Figure 3.3 Geopolitics: Science brings an international vibe to Svalbard, but it also marks Norwegian presence. Photo by Jakub Žárský

> there is nothing natural or self-evident about what kinds of substances, elements, objects, or pieces of knowledge become understood and seen as resources available for extractive operations: the discursive construction of something as a "resource" always entails the employment of a wide set of knowledges, practices and power relations which regulate how the relationship between nature and the society is imagined and enacted at different points in time and space.

It is not just Svalbard's natural resources that are at stake. There are also other traces of extractivism in the new industries. Tourism extracts in a soft and apparently clean way, compared to the hard and dirty power that engages with the environment following the logic of "let's take what is out there before somebody else does it," be it oil, gas, coal, or other minerals. But the driving force of "do it now before it's too late" is present here, too (Figure 3.4). Overtourism (Saville, 2019a), mass tourism (Andersen, 2022), last-chance tourism (Johnston, Viken & Dawson, 2012) – academics and stakeholders are still arguing whether it is correct to use such terms in the case of Svalbard where tourists, guides, and workers in the hospitality industry have seen the sector grow year by year. Tourism stakeholders in Svalbard take the case of tourism peak in Iceland in the 2010s (Sæþórsdóttir, Hall, & Wendt, 2020), unable to accommodate the interest of international visitors, as a lesson learned. During another community dialogue held in November 2020, this

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Figure 3.4 Tourism: Last chance to see a retreating glacier? Photo by Zdenka Sokolíčková

time looking at the issue of use of nature, the question of volume and consumption was brought up. How do we manage tourism in an exclusive and unique destination when the more special the place is, the more people desire to visit it?

While the notion of the extractivist potential of tourism regarding natural resources is known and has been long discussed (Kaltenborn, Østreng, & Hovelsrud, 2020), little attention is paid to exploitation of the so-called human resources. Guides, and cleaning and catering personnel, the vast majority of them non-Norwegian, bear the increasing burden of precarity, not least during the current pandemic. They are necessary for the tourist industry but inappropriate as tools for the state policy where the non-Norwegian population is seen as a security issue (Pedersen, 2017), and they fail to fit into the postcard image of what Svalbard should look like. Without a population that disposes of mechanisms needed to create a sense of community and place attachment strong enough to become politically relevant (Sokolíčková, in press), it is hard to say with what kind of "local added value" tourism could contribute. There are many barriers of communitification in Longyearbyen, and people here lack "a strategic tool in the negotiation of rights and ownership and an instrument in their quests towards certain desired futures" (Jørgensen, 2019: 1). Tourism certainly generates profit, jobs, makes stores, and dining facilities in town economically viable, and pushes for better, faster, and cheaper flight connections. The question does not so much concern what tourism gives back, but to whom, and what the broader consequences are for the ecosystem both locally and globally, and for the community and its cohesion.

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The softness of scientific extractivism is even more delicate. While tourism is dependent on a certain volume, science relies on different financial mechanisms and operates in a different mode. Saville (2019b) has shown how blurred the border lines between tourist and researcher identities are, yet the question of "giving back" still leads to another path in the case of science. As the volume of scientific activities – despite the recent increase (Norwegian Ministry of Education and Research, 2018) – is much less comprehensive than the volume of tourism (except during the pandemic), the environmental pressure is minimal. What is more, scientists are typically environmentally conscious people, and care both rationally and emotionally about having the least possible impact in the field. Scientific practices in Svalbard are regulated by the Svalbard Environmental Protection Act, in addition to strict ethical and environmental codes valid for specific research projects. Compared to jobs in the tourist sector, positions offered to researchers are less precarious, even though short-term contracts have become the norm also in this sphere.

One point about the extractivism of science touches on the FIFO character of the scientific enterprise in Svalbard. Scientists fly in, extract measurements and samples, and return to their laboratories on the mainland for analysis and interpretation. Again, in other regions in the Arctic, for example, in Canada or Greenland, local communities are increasingly becoming aware of the extractivism of science, both natural and social, and act in order to protect their resources and knowledge from being exploited with the assumption that "knowing means owing" (Bocking, 2017: 24). Disciplinary spaces (Bocking, 2007) created by scientifically produced systems of knowledge have impacted "the North" throughout the history of scientific endeavors in the region, and they have contributed both to protection and exploitation (Figure 3.5). Svalbard is no exception here. In Australia, Indigenous groups have opposed a tendency among anthropologists to extract their knowledge and cultural worlds without giving anything in return. As a result, contemporary Australian research on Indigenous groups is often coupled with forms of advocacy and commitment to the people whose life-worlds are being extracted for the sake of academic careers. Lacking an Indigenous population, it could likewise be argued that scientists extract data from Svalbard's environment without giving anything back.

In Svalbard, the call for non-extractive science (inclusive, participatory, transparent, co-productive, humble, and reciprocal in the sense of giving something back) is recently gaining attention, promoting a "public science" contributing more to the "social life of the community" (Bravo, 2006: 237). The discussion about "sustainable tourism" is also very high on the agenda. The key issue concerns returning something to the local region, whether in a social or ecological sense.

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Figure 3.5 Ny-Ålesund: A former company town reinvented as a research hub. Photo by Jakub Žárský

Conclusion

In national economic statistics, a distinction is sometimes made between primary, secondary, and tertiary sectors; extraction and agriculture, manufacturing, and services. In the case of Svalbard, the shift has been from extraction and harvesting to the tertiary sector of services as well as the quaternary sector of research and knowledge production. We suggest talking about hard and soft extractive industries, paralleling the contrast between hard (military) and soft (cultural) power. Oil drilling or mining of coal and minerals would then be seen as hard, harvesting practices such as whaling and fishing as ambiguous, and tourism and science as soft extractive businesses. Hardness and softness can also be complementary in practice, such as construction of infrastructure needed for tourism and research,[5] or the visible wear and tear in the tourist landscape. We do not see the distinction between hard and soft extractivism as a binary but rather as a continuum, or as a neoliberal nexus where tourism and extraction are “sequential, planned regimes of commodifying nature” (Davidov, 2012: 81), and where scientific research also bears traces of extractivist kinship.

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It remains an open question whether tourism and scientific research will contribute to addressing the issues facing the high Arctic, or whether they will merely inscribe themselves into the long history of extractivism – beginning with hunting, trapping, and whaling from the seventeenth century, via mining in the twentieth century, to the present era with its gaze fixated on consumption, with science and tourism being easily incorporated into this ontological framework. Only time can tell if Svalbard and the Arctic will be able to liberate themselves from the straitjacket of destructive consumerism.

To sum up, the main objective of this chapter has been to discuss and eventually defend the relevance of the term "extractivism" in a broader sense than that which is common, including tourism and science. The concept refers to activities that remove something deemed valuable without allowing it to replenish and without giving anything back. In Svalbard, both extractive and reciprocal activities exist, but the former still predominates. We have also highlighted some of the similarities and differences between Svalbard (Longyearbyen) and other mining communities, emphasizing the ecological fragility and climatic barrenness of the archipelago, which simultaneously renders it vulnerable to the destabilizing effects of extractive activities and makes it technically uninhabitable without a constant supply of food, energy, and other resources. One possible conclusion could be that Svalbard ought to be abandoned by humans for reasons of climate and environmental concerns. Yet this would also mean abandoning a rich and unique history, which would lead to a loss of exactly the kind of cultural memory that needs to be salvaged. In addition, the attachment to and identification with Svalbard in the local community should also not be underestimated. The more attractive alternative would therefore be to empower communities in Svalbard politically, enabling them to decide on a future aiming to honor the continuity with a variegated, colorful, but ultimately obsolete past, for the sake of enabling value co-creation instead of extraction.

Notes

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2 It nevertheless deserves mentioning that the whole town of Kiruna is currently being moved because it has literally been undermined by a network of underground tunnels – so even the more stable mining towns have elements of volatility.

3 Longyearbyen still depends on the only Norwegian coal power plant but might switch to another source of energy soon. The options that currently seem most likely in the short run are diesel, wooden pellets, and LNG.

4 In fact, the first petroleum exploration efforts of Norway were in Svalbard, starting in 1961, but never resulting in commercial discoveries. Apart from Norway, it was also the United States,

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France, Belgium, Sweden, and the Soviet Union/Russia who engaged in petroleum exploration in and around Svalbard in the second half of the twentieth century (Senger et al., 2019).

5 Here, Svalbard is an exception rather than a typical example – see the story of Svea in Flyen et al. (2023), see Chapter 9.

References

Allen, I. K. (2021). *Dirty Coal: Populism as Purification in Poland's Mining Heartland*. Stockholm: KTH Royal Institute of Technology.

Andersen, T. (2022). Negotiating trade-offs between the environment, sustainability and mass tourism amongst guides on Svalbard. *Polar Record*. 58, E9. doi:10.1017/S0032247422000080

Blanco, E. (2011). A social-ecological approach to voluntary environmental initiatives: The case of nature-based tourism. *Policy Sciences*, 44(1), 35–52. https://doi.org/10.1007/s11077–010-9121-3

Bocking, S. (2007). Science and spaces in the northern environment. *Environmental History*, 12, 868–895. https://doi.org/10.1093/envhis/12.4.867

Bocking, S. (2017). Navigating northern environmental history. In S. Bocking and B. Martin, eds., *Ice Blink: Navigating Northern Environmental History*. Calgary: University of Calgary Press, pp. 3–32. https://doi.org/10.2307/j.ctv6cfrkx.3

Brautigam, D. (2009). *The Dragon's Gift: The Real Story of China in Africa*. Oxford: Oxford University Press.

Bravo, M. B. (2006). Science for the People: Northern field stations and governmentality. *The British Journal of Canadian Studies*, 19(2), 221–245. https://doi.org/10.3828/bjcs.19.2.8

Bryceson, D. F., Fisher, E., Jønsson, J. B., and Mwaipopo, R. (2014). *Mining and Social Transformation in Africa: Mineralising and Democratising Trends in Artisanal Production*. London: Routledge.

Büscher, B. and Davidov, V. (2016). Environmentally induced displacements in the ecotourism-extraction nexus. *Area*, 48(2), 161–167. https://doi.org/10.1111/area.12153

Byström, J. (2019). *Tourism Development in Resource Peripheries: Conflicting and Unifying Spaces in Northern Sweden*. Umeå: Umeå University.

Dallmann, W. K. (2015). *Geoscience Atlas of Svalbard*. Tromsø: Norsk Polarinstitutt.

Davidov, V. (2012). From a blind spot to a nexus: Building on existing trends in knowledge production to study the copresence of ecotourism and extraction. *Environment and Society*, 3(1), 78–102. https://doi.org/10.3167/ares.2012.030106

Eriksen, T. H. (2016). *Overheating: An Anthropology of Accelerated Change*. London: Pluto. https://doi.org/10.2307/j.ctt1cc2mxj

Eriksen, T. H. (2018). *Boomtown: Runaway Globalisation on the Queensland Coast*. London: Pluto.

FAO, Food and Agriculture Organization. (2018). Sustainable Development Goals. Website. www.fao.org/sustainable-development-goals/indicators/1441/en/

Flyen, A-C., Avango, D., Fischer, S., and Winqvist, C. (2023). Remediating mining landscapes. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Gilmore, J. S. (1976). Boom towns may hinder energy resource development: Isolated rural communities cannot handle sudden industrialization and growth without help. *Science*, 191, 535–540. https://doi.org/10.1126/science.191.4227.535

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Golub, A. (2019). Mining. *Cambridge Encyclopedia of Anthropology*. Online article. www.anthroencyclopedia.com/entry/mining

Graham, N. (2020). Fossil knowledge networks: Science, ecology, and the "greening" of carbon extractive development. *Studies in Political Economy*, 101(2), 93–113. https://doi.org/10.1080/07078552.2020.1802831

Guzmán-Gallegos, M. (2019). Counting: Health emergencies and the constitution of extractive natures in Northern Loreto, Peru. In A. B. Stensrud and T. H. Eriksen, eds., *Climate, Capitalism and Communities*. London: Pluto, pp. 133–150. https://doi.org/10.2307/j.ctvjnrw0q.12

Herva, V.-P., Varnajot, A., and Pashkevich, A. (2020). Bad Santa: Cultural heritage, mystification of the Arctic, and tourism as an extractive industry. *Polar Journal*, 10 (2), 375–396. https://doi.org/10.1080/2154896X.2020.1783775

Hovelsrud, G. K., Kaltenborn, B. P., and Olsen, J. (2020). Svalbard in transition: Adaptation to cross-scale changes in Longyearbyen. *Polar Journal*, 10(2), 420–442. https://doi.org/10.1080/2154896x.2020.1819016

Jacka, J. K. (2018). The anthropology of mining: the social and environmental impacts of resource extraction in the mineral age. *Annual Review of Anthropology*, 47(1), 61–77. https://doi.org/10.1146/annurev-anthro-102317-050156

Jacquet, J. (2009). *Energy Boomtowns and Natural Gas: Implications for Marcellus Shale Local Governments and Rural Communities*. University Park, PA: The Northeast Regional Center for Rural Development.

Johnston, M., Viken, A., and Dawson, J. (2012). Firsts and lasts in arctic tourism: Last chance tourism and the dialectic of change. In H. Lemelin, J. Dawson, and E.J. Stewart, eds., *Last Chance Tourism*. London: Routledge, pp. 10–24. https://doi.org/10.4324/9780203828939-9

Jørgensen, A. M. (2019). Communitification and emotional capital: Producing, shaping and re-shaping communities before and after mining in Norrbotten and Disko Bay. *Polar Record*, 56(e7), 1–11. https://doi.org/10.1017/S0032247419000548

Junka-Aikio, L. and Cortes-Severino, C. (2017). Cultural studies of extraction. *Cultural Studies*, 31(2–3), 175–184. https://doi.org/10.1080/09502386.2017.1303397

Justis- og politidepartementet. (1974–1975). St. meld. nr. 39: Vedrørende Svalbard. Online publication. www.stortinget.no/no/Saker-og-publikasjoner/Stortingsforhandlinger/Lesevisning/?p=1974-75&paid=3&wid=c&psid=DIVL814&s=True

Kaltenborn, B. P. and Emmelin, L. (1993). Tourism in the High North: Management challenges and recreation opportunity spectrum planning in Svalbard, Norway. *Environmental Management*, 17(1), 41–50. https://doi.org/10.1007/BF02393793

Kaltenborn, B. P., Østreng, W., and Hovelsrud, G. K. (2020). Change will be the constant: Future environmental policy and governance challenges in Svalbard. *Polar Geography*, 43(1), 25–45. https://doi.org/10.1080/1088937x.2019.1679269

Kalvig, S. (2021). Verdens øyne er rettet mot Svalbard. *E24*, 20 April 2021. Online article. https://e24.no/det-groenne-skiftet/i/x3083n/verdens-oeyne-er-rettet-mot-svalbard

Kirsch, S. (2006). *Reverse Anthropology: Indigenous Analysis of Social and Environmental Relations in New Guinea*. Stanford, CA: Stanford University Press.

Kohrs, E. (1974). Social consequences of boom growth in Wyoming. Online article. www.sublettewyo.com/Archive/ViewFile/Item/97

Kruse, F. (2013). *Frozen Assets: British Mining, Exploration and Geopolitics on Spitsbergen, 1904–53*. Groningen: Barkhuis.

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Latour, B. (1993). *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.

Lopez, B. (1987). *Arctic Dreams*. London: Picador.

Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition: Arctic legacies. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

McNeill, J. R. and Engelke, P. (2016). *The Great Acceleration: An Environmental History of the Anthropocene Since 1945*. Cambridge, MA: Harvard University Press. https://doi.org/10.4159/9780674970731

Midgley, S. J. (2012). *Co-producing Ores, Science and States: High Arctic Mining at Svalbard (Norway) and Nanisivik (Canada)*. Unpublished Master Thesis. Memorial University of Newfoundland.

Norwegian Ministry of Education and Research. (2018). Strategy for research and higher education in Svalbard. Online publication. www.regjeringen.no/contentassets/3b322b7aec8942cf8a8bcd09e498547f/strategy-for-research-and-higher-education-in-svalbard.pdf

Norwegian Ministry of Justice and Public Security. (2015–2016). Meld. st. 32 (2015–2016): Report to the Storting (White Paper). Online publication. www.regjeringen.no/en/dokumenter/meld.-st.-32-20152016/id2499962/

Næringsdepartementet. (1990–1991). St. meld. nr. 50: Næringstiltak for Svalbard. Online publication. https://stortinget.no/nn/Saker-og-publikasjonar/Stortingsforhandlingar/Lesevisning/?p=1990-91&paid=3&wid=d&psid=DIVL1575

Pedersen, T. (2017). The politics of presence: The Longyearbyen dilemma. *Arctic Review on Law and Politics*, 8, 95–108. https://doi.org/10.23865/arctic.v8.682

Pijpers, R. J. and Eriksen, T. H., eds. (2018). *Mining Encounters*. London: Pluto. https://doi.org/10.2307/j.ctv893jxv

Revelin, F. (2013). Ecotourism and extraction in Saami lands: Contradictions and continuities. In B. Büscher and V. Davidov, eds., *The Ecotourism/Extraction Nexus: Rural Realities and Political Economies of (un)Comfortable Bedfellows*. London: Routledge, pp. 193–214. https://doi.org/10.4324/9780203384855-20

Ruiz-Frau, A., Kaiser, M. J., Edwards-Jones, G., Klein, C. J., Segan, D., and Possingham, H. P. (2015). Balancing extractive and non-extractive uses in marine conservation plans. *Marine Policy*, 52, 11–18. https://doi.org/10.1016/j.marpol.2014.10.017

Sartre, J.-P. (1977 [1960]). *Critique of Dialectical Reason*. London: Verso.

Saville, S. (2019a). The Northern-most Overtourism? Online publication. https://samsaville.files.wordpress.com/2019/12/51fcd-the-northern-most-overtourism-for-website.pdf

Saville, S. (2019b). Tourists and researcher identities: Critical considerations of collisions, collaborations and confluences in Svalbard. *Journal of Sustainable Tourism*, 27(4): 573–589. https://doi.org/10.1080/09669582.2018.1435670

Senger, K., Brugmans, P., Grundvåg, S.-A., Jochmann, M., Nøttvedt, A., Olaussen, S., Skotte, A., and Smyrak-Sikora, A. (2019). Petroleum, coal and research drilling onshore Svalbard: A historical perspective. *Norwegian Journal of Geology*, 99(3). https://dx.doi.org/10.17850/njg99–3-1

Sisneros-Kidd, A. M., Monz, C., Hausner, V., Schmidt, J., and Clark, D. (2019). Nature-based tourism, resource dependence, and resilience of Arctic communities: Framing complex issues in a changing environment. *Journal of Sustainable Tourism*, 27(8), 1259–1276. https://doi.org/10.1080/09669582.2019.1612905

Sokolíčková, Z. (in press). The trouble with local community in Longyearbyen, Svalbard. *Polar Record*.

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Sokolíčková, Z. (in prep.). *The Paradox of Svalbard: Climate Change and Globalisation in the Arctic*. London: Pluto.

Sörlin, S. Dale, B., Keeling, A., and Larsen, J. N. (2023). Patterns of Arctic extractivism: Past and present. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Stoddart, M. C., Mattoni, A., and McLevey, J. (2020). Introduction: Contact points between offshore oil and nature-based tourism. In M. C. Stoddart, A. Mattoni, and J. McLevey, eds., *Industrial Development and Eco-Tourisms: Can Oil Extraction and Nature Conservation Co-exist?* Cham: Springer International Publishing, pp. 1–26. https://doi.org/10.1007/978-3-030-55944-1_1

Sæþórsdóttir, A. D., Hall, C. M., and Wendt, M. (2020). From boiling to frozen? The rise and fall of international tourism to Iceland in the era of overtourism. *Environments*, 7 (8), 59. https://doi.org/10.3390/environments7080059

Ulfstein, G. (1995). *The Svalbard Treaty: From Terra Nullius to Norwegian Sovereignty*. Oslo: Scandinavian University Press.

Viken, A. (2020). Turisme, kunnskapshegemonier og sjølregulering på Svalbard. In A. Viken, R. Benonisen, C. Ekeland, A. Førde, R. Nilsen, T. Nyseth, C. Olufsen, O. Sletvold, and G. E. Svensson, eds., *Turismens paradokser: turisme som utvikling og innvikling*. Stamsund: Orkana akademisk, pp. 301–320.

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4

Scenarios and Surprises

When Change Is the Only Given[1]

ANNIKA E. NILSSON AND SIMO SARKKI

Introduction

The vision of the Arctic as a treasure chest of natural resources has gained renewed traction in recent years due to a combination of climate change, expectations of increasing global demand, and geopolitical concerns about securing the supply of critical innovation metals. This increasing interest often stems from global and national perspectives on the Arctic. While regional authorities and some local communities welcome the potential for new job opportunities and economic investments, concerns about the long-term sustainability of extractive industries have also led to conflicts over land use and criticism about the lack of sufficient dialogue with Indigenous peoples, not least in the Nordic Arctic (Koivurova et al., 2015; Bjørst, 2016; Lawrence & Larsen, 2017; Beland Lindahl et al., 2018; Dannevig & Dale, 2018; Harnesk, Islar, & Stafström, 2018; Magnusson & Dale, 2018; Zachrisson & Beland Lindahl, 2019; Österlin et al., 2023, see Chapter 5). Such conflicts raise questions about who has a legitimate right to define sustainable development in a local and regional context. The level of conflict between different interests suggests a lack of legitimacy of current impact assessment processes and has also led to calls for approaches that take a more holistic view of the environmental and social impacts compared to current decision frameworks (Karvinen & Rantakallio, 2019). The need for improved assessment processes concerns the quality of the knowledge base for politically negotiated decisions about mining and related industries but also relates to calls for transparency and equal participation for those who are or would be affected by the decisions.

The aim of this chapter is to discuss how exploratory scenario methods could be used in the context of improving assessment processes related to mining. We argue that scenario exercises have the potential of involving local and regional actors in the visioning of Arctic futures in ways that would not only provide a broader view

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of the role of extractive industries for the future of a region but also include attention to the social, environmental, and technological uncertainties that are unavoidable when trying to assess the long-term impacts of mining. We discuss some limitations of current scenario approaches based on a synthesis of published scenarios of possible Arctic futures, summarize key insights from a series of participatory scenario workshop focusing on local views of sustainable development, and use this as a base to suggest steps for improving participatory scenario methods. We thereby specifically add attention to the potential impacts of so-called wild-card developments. We furthermore suggest that insights from such improved scenarios can be used for exploring how both known drivers of change and surprises may affect the dynamics of social-ecological-technological systems to provide more holistic and proactive assessments of the impacts of extractive industries.

Exploratory Scenarios of Arctic Futures

Exploratory scenarios have been used widely for a few decades to understand the dynamics of change in situations of uncertainty and can also be used for exploring how large-scale drivers might affect local developments (Millennium Ecosystem Assessment 2005; van Vuuren et al., 2012). The scenarios are not projections or predictions of the future but describe various alternative plausible futures and provide schematic descriptions of how the future might unfold under a logic framed by variations in key drivers of change. Because they outline plausible development paths without being policy prescriptive, they are useful for assessing the robustness of different policy options in situations of uncertainty about the drivers of change that are in focus (Kok, Biggs, & Zurek, 2007).

There is a large number of published scenarios that explore potential Arctic futures in light of climate change and various visons of industrial development in the region (for reviews, see Arbo et al., 2012; Nilsson, Bay-Larsen, Carlsen et al., 2017a; Erokhin & Rovenskaya, 2020). However, while some general insights about the role of extractive industries can be gleaned from the scenario literature, none of the published scenarios explicitly targets the relationships between extractive industries and Arctic local communities. Furthermore, many scenario narratives focus on a limited set of mainly large-scale drivers of change and pay limited attention to the impact of surprises (Nilsson et al., 2019). Surprises are here seen as “wild cards”: imaginable and concrete events or developments that may seem unlikely but could have wide-ranging impacts if they became a reality (Fergnani, 2021).

In our review of insights from already conducted scenario exercises, we first classify five published Arctic scenario narratives under general scenario archetypes

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(Harrison et al., 2019) in order to draw out some insights that relate specifically to extractive industries. We then add nuance to the discussion about drivers of change by drawing on local perspectives from nine bottom-up scenario exercises that have been conducted across the Nordic Arctic, and we then elaborate on some potential wild cards that are relevant for different scenario archetypes.

Scenario Archetypes

Taking a starting point in a review of Arctic scenarios by Erokhin and Rovenskaya (2020) and adding relevant additional published scenarios, we have selected five scenario sets for further analysis based on their relevance for resource extraction. The following studies were selected: Loe et al. (2014) present three scenarios for business opportunities in the Arctic in 2020 with a special focus on petroleum, mining, seafood, and shipping based on workshops and in-depth interviews with business leaders and Arctic experts. Brigham (2007) presents four narratives exploring implications of major drivers of Arctic change, including increasing natural-resource extraction activity. Lazariva et al. (2021) combine desktop research with a series of in-depth interviews and seminars with key stakeholders and develop four narratives for the Arctic until 2050. Haavisto et al. (2016) present six narratives for the Eurasian Arctic by 2040 focusing on the development of shipping, resource extraction, and tourism industries based on a literature review, pre-survey, and an expert workshop. Burkhart, Seadas, and Wichmann, (2016) present four narratives exploring two critical uncertainties: global oil price and Arctic governance, based on interviews with government officials, industry leaders, Indigenous groups, and scientists.

The selected scenario sets were organized according to six scenario archetypes proposed by Harrison et al. (2019). The archetypes are business-as-usual, economic optimism, regional competition, regional sustainability, global sustainable development, and inequality. To capture the breadth of Arctic scenario narratives, we added one more archetype, which we call Frozen development. This scenario type was identified based on the Arctic scenario exercises we reviewed. The results of the analysis are summarized in Table 4.1.

The scenario archetypes have varying implications for the relationship between extractive industries and local communities: While "Economic optimism" may bring benefits for Arctic communities, it also implies the undermining of traditional livelihoods. The "Regional competition" and "Inequality" scenarios have mostly negative implications for local communities. Sustainability at global scale appears to be beneficial also for Arctic communities but includes a risk that the economy and global environment are emphasized at the expense of local socio-cultural issues. At its extreme, a focus on environmental sustainability may even lead to a situation where economic activities in the Arctic are banned.

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Table 4.1. *Arctic scenario narratives typologized under general scenario archetypes (Harrison et al., 2019) and their implications for relationships between extractive industries and Arctic local communities*

Global Scenario archetypes	Arctic scenarios narratives	Implications for natural resource extraction in the Arctic	Potential implications for local communities in the Arctic
Business-as-usual: Moderate population and economic growth; Persisting inequality; Markets and institutions are stable.	"Managed boom" (Burkhart et al., 2016)	Extensive extractive activities while some sustainability norms are in place governing economic activities.	Some conflicts; Moderate regulation of extractive projects where local communities are mainly engaged via impact assessments.
Economic optimism High economic growth; Low regulation; Population growth low; Reactive attitude to environmental problems; Efficient technologies.	"Free for all" (Burkhart et al., 2016) "Globalized frontier" (Brigham, 2007) "Oil in demand" (Loe et al., 2014)	International access to Arctic resources, and growing interest in extractive industries; Lack of regulation; Rising global prices of minerals intensify extractive activities but may lead to conflicts and environmental damage.	Indigenous and local people benefit from employment opportunities; Economic growth; Due to low regulation, traditional livelihoods and ecosystems tend to suffer.
Regional competition Social fragmentation; Competition, instability erode international trade and cooperation; Emphasis on national and regional self-sufficiency; Technological innovation low.	"Polar lows" (Burkhart et al., 2016) "Wild west" (Haavisto et al., 2016) "Age of discovery" (Lazariva et al., 2021) "Fortress frontier" (Brigham, 2007) "Re-freeze" (Loe et al., 2014)	Intensive development of extractive industries; Arctic states guard their resources; Low and fragmented regulation; Rush to resources makes Arctic more and more profitable and attractive for private investors, and related risks are covered by states; Escalating climate crisis.	Development driven by large/multinational corporations and resources are mostly privatized; Local livelihoods deteriorate; Indigenous peoples and their claims are ignored; Arctic society splits: urban communities and professional opportunity-seekers flourish, while Indigenous peoples suffer.

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Regional sustainability Local and regional policy focusing on welfare, equality, and environmental protection; International collaboration low; Technological innovation and economic growth moderate but uneven.	"Isolated Arctic" (Burkhart et al., 2016) "Equitable frontier" (Brigham, 2007) "Shangri La" (Haavisto et al., 2016)	Extractive projects sustainable; Multi-level regulation is clear and equitable; Efficient resource extraction; Respect for carrying capacity.	Conflict-free Arctic; Indigenous rights; More income for local communities also from extractive projects; Good prospects for local livelihoods.
Global sustainable development High cooperation and top-down governance with proactive regulation for the environment; Rapid innovation in green and resource-efficient technologies.	"Renaissance" (Lazariva et al., 2021) "Adaptive frontier" (Brigham, 2007) "Green Transformation" (Loe et al., 2014) "Silicon Valley" (Haavisto et al., 2016)	Balanced sustainability and strong regulation of extractive projects. Incentives for sustainable technologies; Oil and gas not used; New clean technologies boom; Corporate Social Responsibility; Economic growth does not increase environmental footprint.	Fly in fly out workers; Indigenous peoples maintain traditional ways of life, languages, and cultures, and are participating in the decision-making processes. However, socio-cultural aspects may lag behind due to strong focus on economy and environment.
Inequality Political and business elites have most power, leading to increasing economic, political, and social inequalities and fragmentation.	"Exploited colony" (Haavisto et al., 2016) "Conflict zone" (Haavisto et al., 2016) "Dark ages" (Lazariva et al., 2021)	Fierce competition over resources; Short-term profits drive resource extraction; Companies seen as pillars of national economy; Rules and regulations weak; Deep-sea mining; Decreasing opportunities for diversification and new market development; Economy based on extractive industries.	Conflicts between native people, immigrant workers, and public authorities; High influx of workers to the area because of increased employment possibilities leading to hub-based development and urbanization; Arctic becomes a depopulated and devastated industrial site. Indigenous people assimilate and out-migrate.

Table 4.1. (*cont.*)

Global Scenario archetypes	Arctic scenarios narratives	Implications for natural resource extraction in the Arctic	Potential implications for local communities in the Arctic
	Frozen development "Antarctic" (Haavisto et al., 2016) "Romanticism" (Lazariva et al., 2021)	Very strict environmental regulation as risks related to the impacts of Arctic resource exploitation are considered too high; Arctic is turned into a sanctuary; Only sustainable energy and transport, no mining or extractive projects.	Traditional livelihoods flourish, ecotourism brings external revenue; Economic activity has been limited to sustainable fishing and herding, local crafts, and sustainable tourism; Indigenous peoples maintain their traditional way of life and receive social payments; Lack of economic opportunity and declining living standards lead to out-migration of professionals and the urban population.

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Insights from Participatory Scenario Exercises

To complement the synthesis of Arctic scenarios, we draw on insights from a series of scenario exercises based on a method to develop so-called extended shared socio-economic pathways (Nilsson et al., 2017b). The method includes asking the participants an open question: What future changes may influence this region economically, environmentally, and socially within the perspective of one to two generations? The question guided nine participatory scenario exercises that were conducted between 2015 and 2020, covering various local contexts across the Nordic Arctic, with and without mining or proposed mining activities. These were held in Sweden: in Pajala in 2015 (Nilsson, Carlsen, & van der Watt, 2015) and in Kiruna in 2019 (Nilsson, 2020); in Norway: in Bodø in 2015 (van Oort, Bjørkan, & Klyuchnikova, 2015) and 2020, and in Alta in 2018; in Greenland: in Ilulissat in 2018 and in Narsaq in 2019; (Vangelsten et al. 2022); and in Finland: in Inari in 2015. In addition, one workshop was conducted in Kirovsk, Russia (2015) (van Oort et al., 2015) (Figures 2.1 and 2.2). The methodology provided the participants with an opportunity to brainstorm freely in relation to the open question about what future changes may influence the region, followed by a conversation in which local drivers of change were discussed in relation to various global development paths in the so-called Shared Socio-economic Pathways (SSPs) (O'Neill et al., 2017). The SSPs are narratives of potential global futures that were developed to provide a base for assessing challenges to climate mitigation and adaptation. A major contrast between the local scenario exercises and the scenarios reviewed in our literature synthesis was the focus on drivers of change that were deemed especially relevant for local and regional development paths, as envisioned by the participants in the exercises. The results thus provide a different perspective than the scenarios of circum-Arctic futures (see Table 4.1) that often focus on larger-scale developments.

For the analysis in this chapter, the raw data from the brainstorming exercises was compiled according to the categories of drivers that guided the development of the global SSPs (Nilsson, 2021). Our analysis was then guided by eight generic components of social-ecological-technological systems as elaborated by (Nilsson, Avango, & Rosqvist, 2021a): the abiotic environment, biodiversity and ecosystem, technical artifacts, social networks and demography, actors and agency, markets, knowledge, and institutions. Based on the analysis, we selected four overarching themes to discuss in more detail: market demand, politics and power relations, demographic trends, and technology. They were selected because they appear to be relevant in shaping the future of the Nordic Arctic regardless of the specific economic, cultural, and political context in each scenario exercise location, and, furthermore, they relate to key features of social-ecological-technological systems that are especially relevant for understanding the expansion of extractive industries. In the following text we explore these issues in more detail.

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Extraction of resources in the Nordic Arctic would not happen without *expectations of market demand*. Historically, this demand has shifted many times, leading both to local boom economies and to bust cycles with abandoned mining towns or towns in economically dire situations (Huskey, Mäenpää, & Pelyasov, 2014; Malmgren et al., 2023, see Chapter 11; Sörlin et al., 2023, see Chapter 2). As long as the local economies are narrow, which is often the case in the Arctic, this dependency is likely to continue. With growing awareness about the need to radically cut emissions of greenhouse gases, expectations of market demand for Arctic resources are now overlaid with a larger-scale technological shift away from the hegemony of fossil-fuel energy, which is still in high demand, to an increasing demand for some metals and for wind and solar power. Consumer preferences may play some role in this shift. In several scenario exercises, issues related to lifestyle choices were mentioned, which may affect what products and services would be desired, for example the demand for electric vehicles, travel habits, and dietary diversity. Another and potentially more important driver of this shift is technical innovations, which are often supported by politically decided economic incentives, such as public investments and tax structures. They thus link to an ongoing shift in overarching social norms at the national and international levels about the importance of mitigating climate change, including the uncertainties and the social negotiations that are inherent in major normative shifts. Another recurring issue in scenario exercises was attention to the potential of tourism and the tourism market's demand for Arctic environments with pristine nature and quiet surroundings.

While many industrial actors expect mining to expand, the local scenario discussions also included concerns about what may happen when a specific mine is no longer economically viable. Even slight shifts in market conditions can affect the profitability of a mine, and the consequences could be major if the local social-ecological-technological system is not resilient, as witnessed by Arctic ghost towns that were once lively mining settlements (Keeling & Sandlos, 2017; Malmgren et al., 2023, see Chapter 11). However, expectations of increasing demand can have equally large implications locally if they lead to new or expanding mining activities. Expectations can raise hopes among unemployed youth but also lead to competition over the available labor force. As mining plans materialize, expectations can also create demand for new housing, a need for local investments in infrastructure, as well as in-migration that changes the social dynamics of a place.

Expectations of future demand (increasing or decreasing) are interlinked with political ambitions (environmental as well as industrial) and geopolitical considerations that may affect permit processes and public investment in supporting infrastructure. A strong message from the local scenario exercises was that the participants saw *power relations* as central to how the local future might develop. Furthermore, many people who took part in the exercises expressed

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that power over local futures lies somewhere else, in the national capital or among transnational corporate actors. Power often relates to institutional structures that support extractive activities because they are framed as valuable from national and international perspectives. Meanwhile, local and regional power is in practice often limited in decisions about extractive industries in the Nordic Arctic. But some local power exists. In Norway, municipalities have a veto. In Sweden, national interests (*riksintressen*) weigh heavily but those are many. Furthermore, local voices often have less economic and narrative clout than industrial actors, which is critical in deciding whose narratives drive processes of "development." However, an ongoing change in norms with implications for power relations is the increasing recognition of Indigenous rights in international law. For example, scenario exercise participants in a workshop that mainly included young reindeer herders saw future development and its local implications as uncertain but important for Indigenous livelihoods and recognition of Indigenous knowledge, as well as for the sense of inclusiveness in local societies.

Often, the power of people who live in the north seems to lie mainly at the personal level, in decisions about whether to move or stay. A place must be attractive to live in, as highlighted by one workshop participant in Kiruna, while the importance of incentives to "come back" was mentioned in the scenario workshop in Alta. *Demography* thus becomes a central concern, with issues ranging from settlement pattern/urbanization to concerns about out-migration of young women and an aging population. The question that follows is whether extractive industries make a place more attractive both in the short and long term. The answers are likely to differ depending on who you are: age and gender play a role but also education (Can I get the relevant education? Do my skills fit the new job market?), and personal affinity to a place, where both the natural environmental and social networks are important. Demographic patterns and changes in them are thus critical factors to consider in assessing the potential impacts of extractive industries, as has also been highlighted in a proposal about issues to include in social impact assessments (Suopajärvi & Jungsberg, 2016).

Another demography-related issue that was brought up in several scenario exercises was in-migration and its potential impacts on the local society. Sources of such influx were discussed primarily in relation to the global movement of people, including worldwide migration and climate refugees but also people coming in from other countries to work in extractive industries or the tourism sector. The impacts of extractive industries on society have been, and will likely continue to be, reflected in the demography of the Nordic Arctic: where people live and who they are. Historic examples include the ghost town created when mining has ceased and when a decline in the workforce led to the tearing down of housing during a downturn in demand (Keeling & Sandlos, 2017; Malmgren et al., 2023, see Chapter 11), but there are also

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less dramatic examples, such as how the opening of a mine near Pajala, near the border between Sweden and Finland, reversed the earlier population decline in the municipality. Another example is how the current industrial boom in northern Sweden has led to demands on politicians to provide incentives for people to move north (Lindberg, 2021). The potential for increased job opportunities in traditional outmigration regions has also been an argument for more mining in policy discussions and in impact assessments (Nilsson et al., 2021).

Technology, including communication and transport infrastructures, is another factor that can be decisive for shaping the future of the Nordic Arctic. In the past, the development of infrastructure has been a precondition for expanding the extraction of non-renewable resources in the Nordic Arctic. This affects not only mining but the potential for economic development more generally, for example, in relation to tourism, where roads and railroads create access to places that can otherwise be difficult to reach. The 500-kilometer-long railroad from Luleå on the Gulf of Bothnia via the inland Arctic mining town Kiruna to Narvik on the Atlantic coast is a case in point.

For future development, digitalization is likely to play an increasingly important role both for mining operations and for society in general. One development highlighted in a scenario exercise was that virtualization and digitalization of industrial processes could pave the way for remote operations. An example from the scenario exercise in Kiruna is the idea that knowhow from a long history of mining could remain an asset even if the local ore was no longer economically viable to mine, as Kiruna could instead became a remote hub for mining operations elsewhere. "Local" mining knowledge could become a key asset in shaping a town's future, even if the local mine was no longer in operation. However, remote operation of mining in the Arctic could potentially also lead to fewer local mining jobs and thus to outmigration. Another aspect of digitalization relates to the fact that media narratives about the Arctic often emerge from global and national perspectives, where social media are now providing venues for local voices to also be heard (Nilsson & Christensen, 2019).

These are just some of the issues that local people in the north see as critical for shaping local futures, aside from the impacts of climate change with its wide-ranging implications for the temperature and precipitation patterns that shape the region's ecosystems. In the workshops, the potential consequences of climate change that were raised included both the risk of food shortages and new possibilities for regenerative agriculture and renewable natural resources. The local scenario exercises thus point to a broader set of issues than discussed in the reviewed published scenarios of Arctic futures. They also point to issues that are not necessarily covered in environmental impact assessments, where the focus is often on specific environmental concerns and other issues regulated by law (Nilsson et al., 2021).

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What If?

In the recent past, development in the Arctic has been characterized by surprises that have changed political expectations (the fall of the Soviet Union), economic structures (Iceland's financial crash), basic features of the Arctic environment (the dramatic decline in Arctic Ocean sea ice with the sea ice minima in 2007 and 2012 as events with geopolitical implications), and the Covid-19 pandemic with severe impacts on the tourism industry. Exploratory scenarios aim to take the possibility of future surprises into account, and, inspired by discussions during bottom-up scenario exercises and recent trends in the discourse on mining, we have identified several "wild card" or "what if" questions that are important in discussing possible Arctic futures. "What if" questions link to imagining the unexpected. They can help to prepare people for extreme future events by pushing the boundaries of conventional thinking to include the unlikely and to cope with alternative futures (Hukkinen, 2008). Wild cards are low probability and high impact events or developments that can be used to enrich scenario narratives by including a broader view of underlying uncertainties. With a focus on the links between extractive projects and local-regional development in the Nordic Arctic, and inspired by the scenario exercises, we suggest wild cards connected to the scenario archetypes from our earlier review of existing scenario narratives, see Table 4.2.

None of these scenarios may play out as they are suggested in the table. In some cases, strong economic and political interests may be at stake to halt the development, and in other cases social inertias and technological lock-ins may halt or delay a certain course of development. However, they illustrate that no future is inevitable. It is also worth noting that surprising impacts of climate change play a role in only one of these narratives (climate migration) and that additional wild card future narratives could be developed based on dramatic changes in the global climate and its environmental and political implications.

Discussion and Future Directions

A major purpose of exploratory scenarios is to imagine the space of uncertainty to be able to better navigate change, either by adapting within the overarching logic of the current context or by managing a transition to something new. Extractive industries have played a prominent role in shaping northern regions by creating socio-technical systems that include technical hardware, institutions, and actor networks (Avango et al., 2019). Given their impact on land use and thus the environment, it is appropriate to also discuss social-ecological-technological systems impacts (Nilsson et al., 2021). Given strong path dependencies, the ongoing discussion about a green transition with its expectations of increasing

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Table 4.2. *Wild cards, their links to scenario archetypes, and implications for extractive projects and local communities in the Arctic (by authors)*

Wild card/ target year	"What if" question	Links between extractive industries and local communities	Links to scenario archetypes
Battery 2040	What if global demand for minerals explodes due to developments in green technology and battery technology?	A strong political focus on climate mitigation leads to a dramatic expansion of mining in the Nordic Arctic, supported by public investments and streamlined permit processes. Local communities cannot say no to mining but derive some benefits, including jobs opportunities and local economic upswings. There is some recognition that the green transition can have negative effects for traditional livelihoods, but it is generally believed that these can be compensated (see Green Deal and Just Transition Mechanism).	Side effects of "Global Sustainability"
Power flip 2040	What if strong Indigenous rights are mainstreamed across all policy sectors and levels?	Extractive projects require consent from Indigenous organizations in the Nordic Arctic. Benefits from extractive industries go to Indigenous people and impacts on Indigenous livelihoods and ways of life are mitigated by agreements reached in negotiations where Indigenous rights and Indigenous knowledge are fully recognized. However, non-Indigenous local people, including other local minorities, do not have a strong voice, resulting in social tensions.	Indigenization and "Regional Sustainability"

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Climate migration 2060	What if adverse impacts of climate change escalate globally and lead to millions of refugees?	Climate change creates millions of refugees from southern countries, with large-scale in-migration to northern regions where summer temperatures are still reasonable. In some places, receding glaciers create new opportunities for extractive projects. Some migrants find work in extractive projects while others develop new ecosystem-based livelihoods, including food production. This increases the pressure on the ecosystem base for traditional livelihoods and on Arctic biodiversity, but the region is overcrowded, and other sources of income are hard to find.	Impacts of "Inequality" and climate crisis
After exploitation 2060	What if Arctic minerals and oil and gas deposits are extracted until they end?	Arctic minerals are heavily used until they are exhausted or no longer economically viable. After the boom, many local economies collapse. Heavy exploitation has created toxic environmental legacies and disrupted ecosystems. Some easily accessible ghost towns now function as sites for dark "industrial" ecotourism. Prospects for traditional livelihoods are degraded and people mainly live in urban centers. The outcome is an empty rural Arctic, while urban centers manage to survive based on other economic activities, many of which require advanced education.	After "Economic optimism" and "Inequality"

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Table 4.2. (*cont.*)

Wild card/ target year	"What if" question	Links between extractive industries and local communities	Links to scenario archetypes
Gender balance 2040	What if gender relations become balanced in Arctic extractive projects?	Extractive industries offer attractive employment opportunities for women, which changes the trend of brain drain caused by young women moving out from the Arctic. As a result, the social dynamics of mining towns change, creating demographically more viable communities.	Gender and "Regional Sustainability"
Automat 2040	What if extractive industries become fully automated?	Technical advances combined with a need to cut costs lead to increasing automation in extractive industries. In many places, the promise of new local jobs never materializes, but in places with strong know-how and human capital local mining knowledge becomes a resource for export and for creating advanced industrial innovation hubs.	"Economic optimism" and technologization

demand of metals may cement this logic. However, there are also discursive struggles about what is acceptable in terms of environmental costs and impacts on Indigenous peoples' livelihoods, where international norms play a much stronger role today than they did when mining expanded in the Nordic Arctic during the 1900s (Koivurova & Petrétei, 2014; Lawrence & Larsen, 2017; Bay-Larsen, Skorstad, & Dale, 2018). Together with the likelihood of surprises caused by climate change, geopolitical developments, technical innovations, or economic fluctuations, it is thus risky to take the past as a template for assessing the sustainability of mining. We instead suggest that it is necessary to better understand the social, ecological, and technological processes that shape the Nordic Arctic and the potential for changes in feedback mechanisms that could lead either to adaptations within the current logic of the relationships that shape interactions between people and between people, the environment, and technology, or to major transformations. Both possibilities could profoundly influence the sustainability of local communities.

Institutional path dependencies, including persistent legal frameworks and constellations of powerful interests, have played an important role in shaping the Nordic Arctic over the past century, partly through the sociotechnical systems related to mining (Avango et al., 2019; Keskitalo, 2019). The stability of the current logic and structure cannot be taken for granted, however. In the literature on Arctic change, both resilience and the possibility of transformative shifts in feedbacks and structures have been discussed extensively, but the focus in the resilience literature has, so far, mainly been on ecological and social processes (e.g., Arctic Council, 2016). In the literature on resilience and transitions, the role of technologies as an important link between between social and environmental processes has received increasing interest (Smith & Stirling, 2010; Ahlborg et al., 2019) but has not been central in the discussions about Arctic change. Given the importance of industry and infrastructure in shaping northern regions, it should be.

Allington et al. (2018) have shown that participatory scenario exercises can be useful for modeling social-ecological systems in settings that include researchers from different disciplines as well as local and regional actors with tacit knowledge of the context in which they live and work. Specifically, they showed that local and regional actors brought up drivers of change that the external experts had not identified, and that an iterative approach that included both system dynamics modeling and scenario exercises forced all the participants to make their assumptions and tacit knowledge explicit. Based on these experiences, we suggest that scenario approaches could also be useful for understanding the role of technologies for societies and environments, including those related to extractive industries. The idea would be to use insights from the scenario exercise to improve the understanding of possible future interactions and feedbacks across different

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parts of a regional social-ecological-technological system. For example, they could guide the analysis of how potential changes might affect feedback loops, potentially leading to radical changes for local communities or whole regions. If carried out in an inclusive participatory setting with local and regional actors, such an approach could make both the visioning of Arctic futures and impact assessments not only more transparent but also inclusive of a wider range of perspectives and knowledges. Adding "what if" questions to such exercises would assist in exploring how robust the base is for sustainable local and regional development. Mining-related "what if" questions can be used for specifically exploring whether the presence or absence of extractive industries would support or erode the social, ecological, and technological base for sustainable local and regional futures.

Exploratory scenarios do not resolve conflicts and are unlikely to lead to consensus about extractive industries. Nor is this their purpose. However, they could serve as tools for developing more holistic assessments of the impacts of mining on sustainable development. Furthermore, they could contribute to more transparency of assessment processes and to the quality of the knowledge base for politically negotiated decisions about mining and related industries.

Note

1 The participatory scenario exercises that have been summarized in this chapter are the result of several different projects and collaborations. In addition to work carried out in the Nordforsk-funded REXSAC, they include Mistra Arctic Sustainable Development; the Arctic Council project Adaptation Action for a ChangingArctic; Gávnnadeapmi 2015; Sustainable Adaptation to Climate Change and Globalization in Disko Bugt, West Greenland, funded by Nordforsk; and Field of Goals, funded by the Norwegian Research Council. The following researchers have been instrumental in organizing the scenario workshop in the Nordic Arctic: L-M. van der Watt, I. Bay-Larsen, M. Bjørkan, B. van Oort, M. Rasch, J. N. Larsen, and B. V. Vangelsten. We furthermore want to express appreciation to all participants in the workshops for sharing their ideas and insights.

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References

Ahlborg, H., Ruiz-Mercado, I., Molander, S., and Masera, O. (2019). Bringing technology into social-ecological systems research: Motivations for a socio-technical-ecological systems approach. *Sustainability*, 11(7), 2009. https://doi.org/10.3390/su11072009

Allington, G. R. H., Fernandez-Gimenez, M. E., Chen, J., and Brown, D. G. (2018). Combining participatory scenario planning and systems modeling to identify drivers of future sustainability on the Mongolian Plateau. *Ecology and Society*, 23(2), art9. https://doi.org/10.5751/ES-10034-230209

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Arbo, P., Iversen, A., Knol, M., Ringholm, T., and Sander, G. (2012). Arctic futures: Conceptualizations and images of a changing Arctic. *Polar Geography*, 1–20. https://doi.org/10.1080/1088937X.2012.724462

Arctic Council. (2016). *Arctic Resilience Report*. Stockholm: Stockholm Environment Institute and Stockholm Resilience Centre. http://hdl.handle.net/11374/1838

Avango, D., Kunnas, J., Pettersson, M., Pettersson, Ö., Roberts, P., Solbär, L., Warde, P., and Wråkberg, U. (2019). Constructing northern Fennoscandia as a mining region. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. Abingdon and New York: Routledge, pp. 78–98.

Bay-Larsen, I., Skorstad, B., and Dale, B. (2018). Mining and Arctic communities. In B. Dale, I. Bay-Larsen, and B. Skorstad, eds., *The Will to Drill: Mining in Arctic Communities*. Cham: Springer International Publishing, pp. 1–11. https://doi.org/10.1007/978-3-319-62610-9

Beland Lindahl, K., Johansson, A., Zachrisson, A., and Viklund, R. (2018). Competing pathways to sustainability? Exploring conflicts over mine establishments in the Swedish mountain region. *Journal of Environmental Management*, 218, 402–415. https://doi.org/10.1016/j.jenvman.2018.04.063.

Bjørst, L. R. (2016). Saving or destroying the local community? Conflicting spatial storylines in the Greenlandic debate on uranium. *The Extractive Industries and Society*, 3(1), 34–40. https://doi.org/10.1016/j.exis.2015.11.006.

Brigham, L. W. (2007). Thinking about the Arctic's future. *The Futurist*, 41(5), 27–34. www.aspeninstitute.org/wp-content/uploads/files/content/docs/ee/Arctic_WSI_Thinking_About_Arctics_Future_Scenarios.pdf

Burkhart, K., Seadas, T., and Wichmann, C. (2016). *Arctic 2030: Planning for an Uncertain Future* (No. M-RCBG Associate Working Paper Series No. 57). Cambridge, MA: Harvard Kennedy School. www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/57_final.pdf

Dannevig, H. and Dale, B. (2018). The Nussir case and the battle for legitimacy: Scientific assessments, defining power and political contestation. In B. Dale, I. Bay-Larsen, and B. Skorstad, eds., *The Will to Drill. Mining in Arctic Communities*. Cham: Springer International Publishing, pp. 151–174. www.springer.com/gp/book/9783319626086.

Erokhin, D. and Rovenskaya, E. (2020). *Regional Scenarios of the Arctic Futures: A Review* (Working paper No. WP-20-013). Laxenburg: IIASA. http://pure.iiasa.ac.at/id/eprint/16648/1/WP-20-013%20a.pdf

Fergnani, A. (2021). Wild cards: What they are and how to use them in futures & foresight. *Predict*. https://medium.com/predict/wild-cards-what-they-are-and-how-to-use-them-in-futures-foresight-64d4755cd35b

Haavisto, R., Pilli-Sihvola, K., Harjanne, A., and Perrels, A. (2016). *Socio-economic Scenarios for the Eurasian Arctic by 2040*. Helsinki: Ilmatieteen laitos. https://helda.helsinki.fi/handle/10138/160254

Harnesk, D., Islar, M., and Stafström, S. (2018). "What local people?" En analys av gruvkonflikten i Gàllok och den samiska befolkningen rättigheter ur ett rättvise- och maktperspektiv. In J. Anshelm, S. Haikola, and B. Wallsten, eds., *Svensk gruvpolitik i omvandling: aktörer, kontroverser, möjliga världar*. Möklinta: Gidlunds Förlag, pp. 101–124.

Harrison, P. A., Harmáčková, Z. V., Aloe Karabulut, A., . . . Hauck, J. (2019). Synthesizing plausible futures for biodiversity and ecosystem services in Europe and Central Asia

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using scenario archetypes. *Ecology and Society*, 24(2), art27. https://doi.org/10.5751/ES-10818-240227

Hukkinen, J. (2008). *Sustainability Networks: Cognitive Tools for Expert Collaboration in Social-Ecological Systems*. New York: Routledge. https://doi.org/10.4324/9780203892824

Huskey, L., Mäenpää, I., and Pelyasov, A. (2014). Economic systems. In J. N. Larsen and G. Fondahl, eds., *Arctic Human Development Report: Regional Processes and Global Challenges*. Copenhagen: Nordic Council of Ministers, pp. 151–182. http://dx.doi.org/10.6027/TN2014–567

Karvinen, P. A. and Rantakallio, S. (eds.). (2019). *Good Practices for Environmental Impact Assessment and Meaningful Engagement in the Arctic – including Good Practice Recommendations. Arctic Council Sustainable Development Working Group*. www.sdwg.org/activities/sdwg-projects-2017-2019/arctic-eia/

Keeling, A. and Sandlos, J. (2017). Ghost towns and zombie mines: Historical dimensions of mine abandonment, reclamation and redevelopment in the Canadian North. In B. Martin and S. Bocking, eds., *Ice Blink: Navigating Northern Environmental History*. Calgary, Alberta: University of Calgary Press, pp. 377–420.

Keskitalo, E. C. H. (2019). Introduction. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. London and New York: Routledge, pp. 1–18. https://doi.org/10.4324/9781315174969

Koivurova, T. and Petrétei, A. (2014). Enacting a new mining act in Finland: How were Sami rights and interests taken into account? *Nordic Environmental Law Journal*, 1, 119–133. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2583748

Koivurova, T., Buanes, A., Riabova, L., Didyk, V., Ejdemo, T., Poelzer, G., Taavo, P., and Lesser, P. (2015). 'Social license to operate': A relevant term in Northern European mining? *Polar Geography*, 38(3), 194–227. https://doi.org/10.1080/1088937X.2015.1056859.

Kok, K., Biggs, R., and Zurek, M. (2007). Methods for developing multiscale participatory scenarios: Insights from Southern Africa and Europe. *Ecology and Society*, 13(1), 8. http://www.ecologyandsociety.org/vol12/iss1/art8/.

Lawrence, R. and Larsen, R. K. (2017). The politics of planning: Assessing the impacts of mining on Sami lands. *Third World Quarterly*, 38(5), 1164–1180. https://doi.org/10.1080/01436597.2016.1257909

Lazariva, A., Kalinin, A., Middleton, A., Nilssen, F., and Belostotskaya, A. (2021). *Arctic 2050: Mapping the Future of the Arctic*, SKOLKOVO Institute for Emerging Market *Studies.* https://ssrn.com/abstract=3784762

Lindberg, A. (2021). Norrland skriker efter arbetskraft – kommunalråd vädjar om flyttbidrag. Dagens Nyheter online article. www.dn.se/ekonomi/norrland-skriker-efter-arbetskraft-kommunalrad-vadjar-om-flyttbidrag/

Loe, J. S., Jakobsen, E. W., and Swanson, P. (2014). *Arctic Business Scenarios 2020*, Oslo: Menon Economics. www.menon.no/publication/arctic-business-scenarios-2020/

Magnusson, T. and Dale, B. (2018). The municipal no to mining: The case concerning the reopening of the Biedjovaggi gold mine in Guovdageainnu municipality, Norway. In B. Dale, I. Bay-Larsen, and B. Skorstad, eds., *The Will to Drill. Mining in Arctic Communities*. Cham: Springer International Publishing, pp. 175–196. www.springer.com/gp/book/9783319626086.

Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*, Cambridge: Cambridge University Press.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Millennium Ecosystem Assessment. (2005). *Ecosystems and Human Well-Being: Synthesis*. Washington, DC: Island Press.

Nilsson, A. E. (2020). *Gruvor och hållbar utveckling i norra Sverige - går det att förena? Rapport från en workshop i Kiruna 6 november 2019* (No. RITA-ABE-RPT-207), Stockholm: Avdelningen för historiska studier av teknik, vetenskap och miljö, KTH. www.rexsac.org/publications/gruvor-och-hallbar-utveckling-norra-sverige/

(2022). Drivers of change in the Nordic Arctic: Compiled keywords from nine exploratory scenario exercises 2015-2020. SND ID 2021-323, Svensk Nationell Datatjänst. https://doi.org/10.5878/4srs-fy44

Nilsson, A. E. and Christensen, M. (2019). *Arctic Geopolitics, Media and Power*. London and New York: Routledge. www.taylorfrancis.com/books/9780429199646

Nilsson, A. E., Avango, D., and Rosqvist, G. (2021). Social-ecological-technological systems consequences of mining: An analytical framework for more holistic impact assessments. *Extractive Industries & Society*, 8(4), 101011. https://doi.org/10.1016/j.exis.2021.101011

Nilsson, A. E., Carlsen, H., and van der Watt, L.-M. (2015). *Uncertain Futures: The Changing Global Context of the European Arctic. Report from a Scenario Workshop in Pajala, Sweden, 9–10 March 2015 (SEI Working Paper No. 2015–12)*. Stockholm: Stockholm Environment Insitute.

Nilsson, A. E., Eklund, N., Jürisoo, M., Klimenko, E., and van der Watt, L.-M. (2019). Regional futures nested in global structures. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. London and New York: Routledge. https://doi.org/10.4324/9781315174969

Nilsson, A. E., Bay-Larsen, I., Carlsen, H., Jylhä, K., van der Watt, L.-M., and van Oort, B. (2017a). Future narratives. In AMAP, ed., *Adaptation Actions for a Changing Arctic: Perspectives from the Barents Area*. Oslo: Arctic Monitoring and Assessment Programme (AMAP). www.amap.no/documents/doc/adaptation-actions-for-a-changing-arctic-perspectives-from-the-barents-area/1604

Nilsson, A. E., Bay-Larsen, I., Carlsen, H., van Oort, B., Bjørkan, M., Jylhä, K., Klyuchnikova, E., Masloboev, V., and van der Watt, L.-M. (2017b). Towards extended shared socioeconomic pathways: A combined participatory bottom-up and top-down methodology with results from the Barents region. *Global Environmental Change*, 45, 124–132. https://doi.org/10.1016/j.gloenvcha.2017.06.001.

Nilsson, A. E., Carson, M., Cost, D. S., Forbes, B. C., Haavisto, R., Karlsdottir, A., Nymand Larsen, J., Paasche, Ø., Sarkki, S., Vammen Larsen, S., and Pelyasov, A. (2019). Towards improved participatory scenario methodologies in the Arctic. *Polar Geography*, 44(2), 75–89. https://doi.org/10.1080/1088937X.2019.1648583

O'Neill, B. C., Kriegler, E., Ebi, K. L., . . . Solecki, W. (2017). The roads ahead: Narratives for shared socioeconomic pathways describing world futures in the 21st century. *Global Environmental Change*, 42, 169–180. https://doi.org/10.1016/j.gloenvcha.2015.01.004

Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Smith, A. and Stirling, A. (2010). The politics of social-ecological resilience and sustainable socio-technical transitions. *Ecology and Society*, 15(1). doi:10.5751/ES-03218-150111

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Sörlin, S. Dale, B., Keeling, A., and Larsen, J. N. (2023). Patterns of Arctic extractivism: Past and present. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Suopajärvi, L. and Jungsberg, L. (2016). *Tools for Monitoring Social Impacts of Large Scale Industries. Working Paper*, Rovaniemi: University of Lapland. https://static1.squarespace.com/static/5649b47fe4b0b9e2752c60c9/t/5b9157e0575d1fb285a0bab0/1536251875704/REGINA_WP_Tools_for_monitoring_social_impacts.pdf

Vangelsten, B. V., Temesgen, A. K., Nilsson, A., Lundberg, A. K., Reinar, M., Dannevig, H., and Selseng, T. (2022). *Planscenarier for Vestland og Nordland*. NF-rapport 11/2022, 3. mai 2022.

van Oort, B., Bjørkan, M., and Klyuchnikova, E. M. (2015). *Future Narratives for Two Locations in the Barents Region (No. CICERO Report 2015:06)*. Oslo: CICERO Center for International Climate and Environmental Research - Oslo. http://hdl.handle.net/11250/2367371

van Vuuren, D. P., Kok, M. T., Girod, B., Lucas, P. L., and de Vries, B. (2012). Scenarios in global environmental assessments: Key characteristics and lessons for future use. *Global Environmental Change*, 22(4), 884–895. https://doi.org/10.1016/j.gloenvcha.2012.06.001

Zachrisson, A. and Beland Lindahl, K. (2019). Political opportunity and mobilization: The evolution of a Swedish mining-sceptical movement. *Resources Policy*, 64, 101–477. https://doi.org/10.1016/j.resourpol.2019.101477

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5

Cumulative Effects on Environment and People

CARL ÖSTERLIN[1], HANNU I. HEIKKINEN, CHRISTIAN FOHRINGER, ÉLISE LÉPY[2], GUNHILD ROSQVIST

Introduction: Multiple Pressures cause Cumulative Effects

Industrial extraction of natural resources and appropriation of land and freshwater areas have led to degraded ecosystems, loss of biodiversity, and extinction of species (IPBES, 2019). The negative effects have often resulted from a history of local changes in the use of land and freshwater resources (Chhabra et al., 2006). Improved management of such resources has therefore become an urgent global concern. In this chapter we address how resource extraction, and particularly mining, has impacted traditional land and freshwater use in the Arctic region Fennoscandia. We use the multiple pressures concept (e.g., Holsman et al., 2017) to explain how effects from seemingly independent human activities have accumulated and now interact with climate change. To illustrate this, we use examples from reindeer herding in Laevas Sámi Reindeer Community (SRC) in northern Sweden, and salmon fishing along the Kemijoki river valley in northern Finland (Figure 5.1).

Environmental assessments have generally been focusing on the impacts of individual industrial or infrastructure projects (Atlin & Gibson, 2017), while less attention has been paid to the combined cumulative effects from multiple types of pressures. This is scientifically problematic, as the focus on individual projects disregards the accumulating, synergistic, or antagonistic effects that the complex interaction between multiple types on pressures in fact may cause (Jones, 2016). It is also ethically problematic because the combined impacts of both historical and proposed human disturbances on species or ecosystems may be downplayed or masked by focusing on individual projects. In this context, a pressure can be defined as the "result of a driver-initiated mechanism (human activity/natural process) causing an effect on any part of an ecosystem that may alter its environmental state" (Oesterwind, Rau, & Zaiko, 2016: 11). The direct impacts from changes in land or freshwater use may be relatively minor in isolation, but

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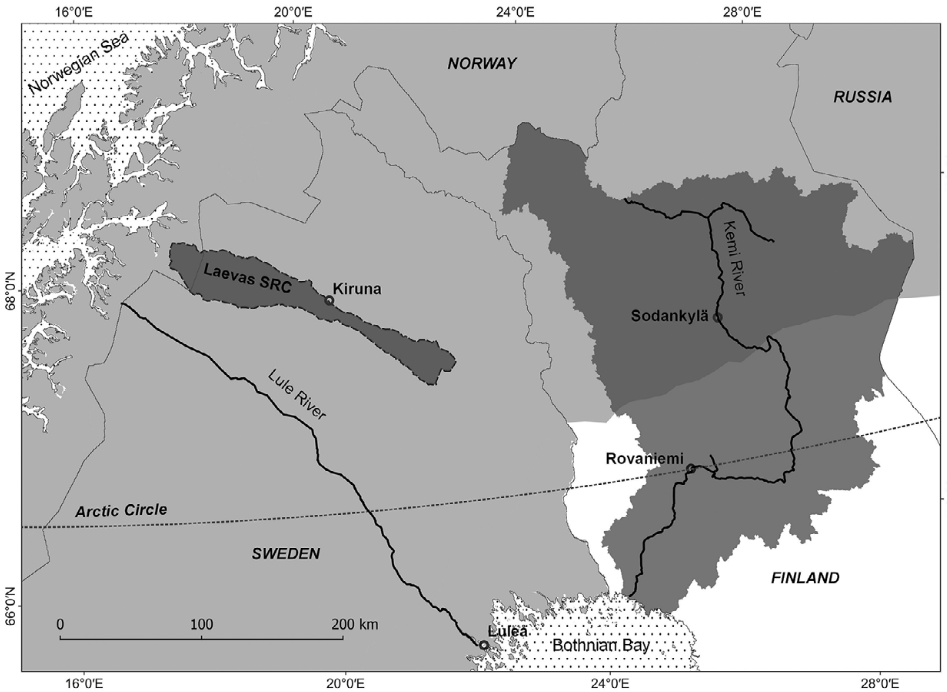

Figure 5.1 Overview of Arctic Fennoscandia, Laevas Sámi Reindeer Community, and the Kemi River catchment area. Drawn by Christian Fohringer

their cumulative effects may significantly change the environmental status of ecosystems. As assessments of impacts from individual industrial projects tend to focus on the local environment, cumulative effects on the larger land- and seascape level are often missed. Therefore, cumulative effects from multiple pressures often remain overlooked in land use planning and natural resource management, despite their potential severity (Bidstrup, Kørnøv, & Partidário, 2016; Atlin & Gibson, 2017; Rosqvist et al., 2023, see Chapter 6).

Arctic Fennoscandia is a resource-rich region with valuable ore minerals such as iron and copper, vast forested areas, and topographic gradients allowing for hydropower developments. The mountains, rivers, cold winter climate, northern lights, and Sámi culture also attract tourists (Rosqvist et al., 2020; Bungard, 2021). It is also a region where reindeer (*Rangifer t. tarandus*) and salmon (*Salmo salar*) are keystone species defining their ecosystems. These two species seasonally migrate over large distances and therefore represent a unique composition of different ecosystems in this Arctic region (CAES, 2002; LaMere, Mäntyniemi & Haapasaari, 2020). Both reindeer herding and salmon fishing are culture-bearing activities that have shaped identities and provided livelihood for residents in Arctic

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Fennoscandia for centuries. Traditional herding of migratory semi-domesticated reindeer is an integral part of indigenous Sámi culture, which was developed in a pristine type of landscape without competition from industrial activities (Brännlund & Axelsson, 2011). Similarly, availability of suitable spawning areas in unregulated free-flowing rivers was a prerequisite for the historical abundance of wild Baltic salmon (Karlsson & Karlström, 1994).

The increasing demand for iron and copper drove the establishment of large-scale mining in Arctic Fennoscandia at the end of the nineteenth century (Avango et al., 2019). The mining industry required efficient transport systems and a vast amount of energy. A railroad was built connecting inland mines in Sweden with the Baltic and Atlantic coasts (Hansson, 1998). Energy was at first produced locally using charcoal. To facilitate the increased power needs, the Swedish state constructed a system of major hydropower plants and dammed the headwaters of the Lule river (Figure 5.1) (Hansson, 2006; Avango et al., 2023, see Chapter 10). Similarly, to supply the growing forest industry in northern Finland with electricity, several major rivers were harnessed for hydropower, for example, Kemijoki, and vast reservoirs were built (Figure 6.1) (Lähteenmäki, 2006). Successively, industrial “mega-systems” were formed in both countries during the twentieth century (e.g., Hansson, 1998; Avango et al., 2019).

Once established, the mega-system functions allowed for more industrial development. The transport infrastructure has also stimulated development of inland and mountain area tourism (Lähteenmäki, 2007; Byström, 2019). Both forestry and damming significantly impacted the spawning of Baltic Salmon and decreased and fragmented reindeer pastures (Magga, 2003). The damming of Lule river was completed with disregard to Sámi opposition and negatively impacted reindeer herding, as the dammed river interrupted migration routes, fragmented landscapes, and flooded grazing areas that were lost or became inaccessible (Össbo, 2014).

Laevas: Impacts on Reindeer Herding

Reindeer have provided vital ecosystem services to humans in the region since the last ice age. In Sweden and Norway, reindeer herding is typically practiced by the Indigenous Sámi people. In contrast, all EU citizens can practice reindeer herding in Finland if accepted by the local herding community. In Russia, reindeer herding is also practiced by multiple ethnic groups (Forbes & Kumpula, 2009). Reindeer herding relies on extensive access and distribution of key reindeer habitat. Its vulnerability depends on the reindeer migration strategy, which can be distinguished into two main types in Fennoscandia: large-scale longitudinal migration between coastal/montane habitat and boreal forest, or small-scale

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circular migration within boreal forest habitats (Tyler et al., 2021). The varying need for space and access to different habitats means that also neighboring SRCs may be subject to variable degrees of vulnerability depending on the disturbances from anthropogenic activities. Today, reindeer herding in Sweden is practiced by fifty-one SRCs, and their grazing area spans over nearly half of Sweden.

Prior to the onset of resource exploitation, the semi-domesticated reindeer of Laevas SRC could migrate over large distances between winter pastures in the eastern forested lowlands and summer pastures in the western mountains and their neighboring SRC (Figure 5.1). The boundaries for Laevas SRC, once determined based on natural borders such as rivers and mountain ridges, form a geographic bottleneck where reindeer migration corridors aggregate. This bottleneck coincides with the location of the expansive mining town Kiruna, where mining commenced in the late nineteenth century and induced a cascade of subsequent infrastructural developments (Figure 5.2). The formation of the mega-system of which Kiruna is part led to increased appropriation of land that in turn encroached and fragmented pastures and led to a loss of key migration corridors.

Current anthropogenic activities within Laevas SRC include mining, establishment of wind farms, clear-cutting of forest, roads, railroads, tourism, military activity, as well as contested pastures with a neighboring reindeer herding community (Fohringer et al. 2021). These anthropogenic activities also generate disturbance zones for reindeer, causing avoidance behavior beyond the activity itself (Polfus, Hebblewhite, & Heinemeveret, 2011). By applying a conservative 500-meter buffer representing the disturbance zone around anthropogenic developments (Figure 5.3), reindeer pastures were shown to have rendered at least 34 percent of Laevas SRC's of their total area and 64 percent of winter pastures functionally unavailable to grazing (Fohringer et al., 2021). This substantial reduction of available grazing areas is highly concerning for Laevas SRC, especially regarding the winter pastures. Winter is a naturally limiting season for reindeer during which they depend largely on forest ecosystems to provide food – terricolous and arboreal lichens (Heggberget, Gaare, & Ball, 2002; Sandström et al., 2006). However, lichen-abundant forests were shown to have decreased by approximately 70 percent across Swedish reindeer herding territory since the 1950s as a consequence of industrial forestry (Sandström et al., 2006; Berg et al., 2008; Horstkotte & Moen, 2019). Therefore, loss of winter grazing areas is particularly threatening for SRCs, such as Laevas.

Climate change contributes significantly to the accumulating pressures and deteriorating conditions in winter grazing areas, as weather and snow conditions strongly determine temporal and spatial grazing opportunities for reindeer (Kivinen et al., 2012; Turunen et al., 2016; Rosqvist et al., 2022). Air temperature has increased during all seasons over the past sixty years in northern Sweden (Berglöv et al., 2015). The largest temperature increase has occurred during the coldest

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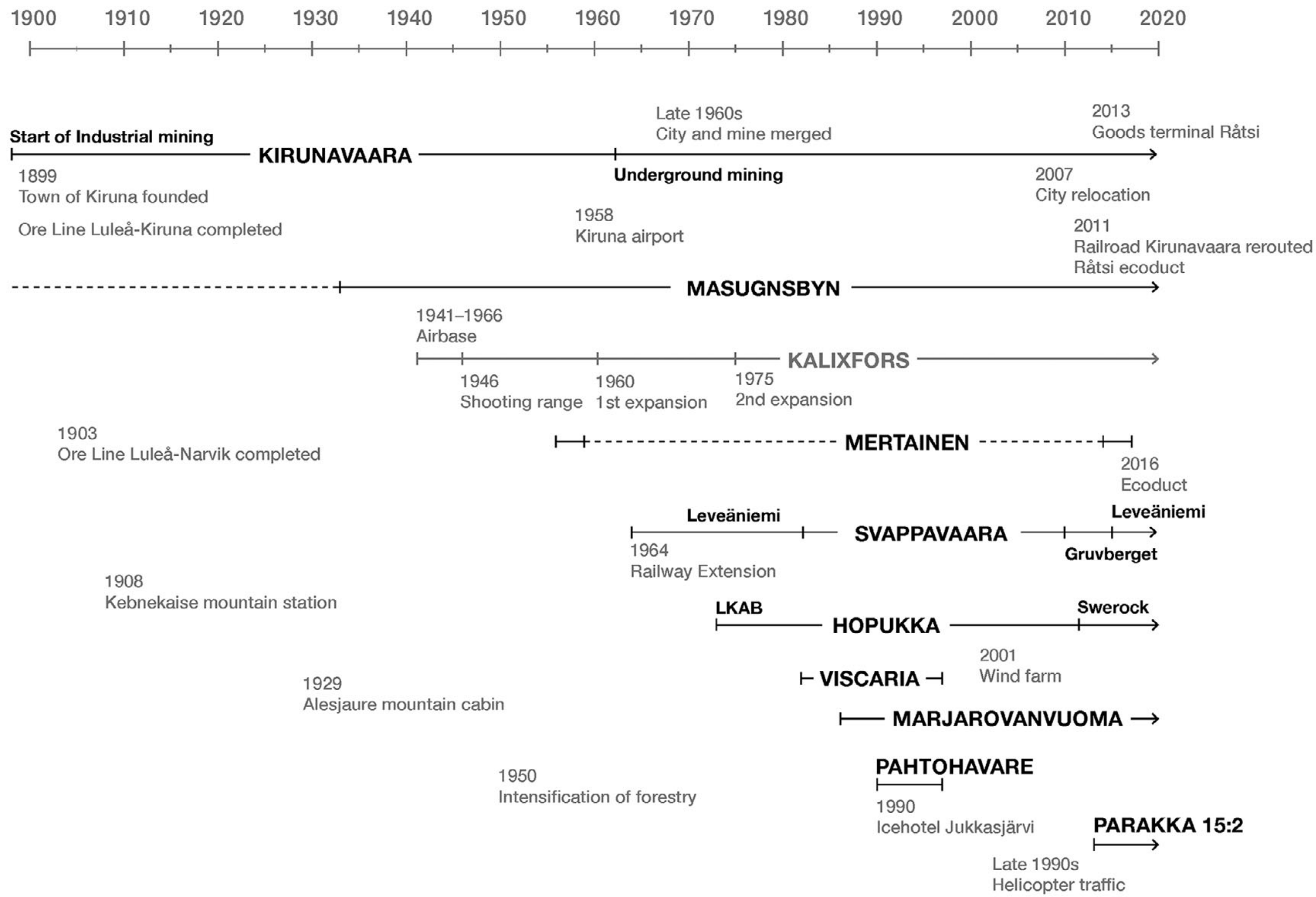

Figure 5.2 Timeline illustrating the establishment of industrial developments since their onset on Laevas Sámi Reindeer Community's grazing grounds from 1900 to present. Grey text represents mines and quarries, while black text represents other infrastructural developments associated with mining. Arrows indicate the ongoing operation of mines. Line breaks indicate changes within development and single dates indicate the establishment and gradual build-up of a factor. Dates refer to the commissioning and further continuation of anthropogenic developments and activities that are considered to have reduced reindeer pasture availability. Gradual changes of land use factors include general dating, e.g., the intensification of forestry or when Kiruna and the Kirunavaara merged. (Modified from Fohringer et al., 2021, People and Nature)

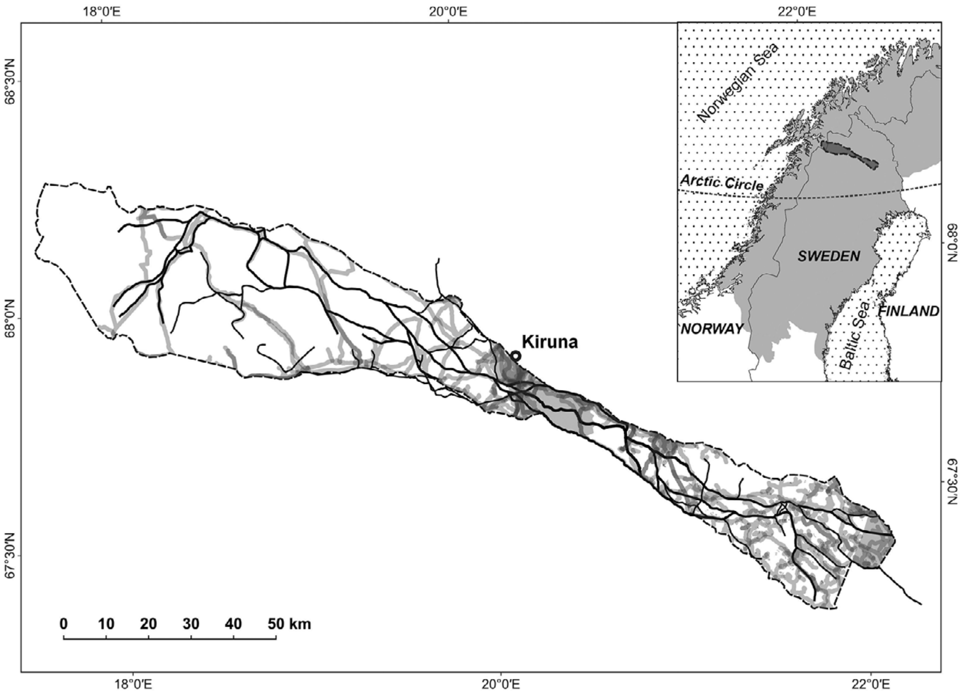

Figure 5.3 Laevas Sámi Reindeer Community (dark grey) in the Swedish portion of Sápmi (light grey), the homeland of the Sámi people, overlapping disturbance zones, based on 500-meter buffers and total area of factors encroaching Laevas SRC's grazing grounds. Grey shades intensify by accumulation of land use from multiple factors. Migration corridors are included as black lines to illustrate where impacts are most pronounced. (Modified from Fohringer et al., 2021, People and Nature)

winter months (December–February). An increase in winter precipitation amounts was recorded during the past thirty years compared to the reference period (1961–1990) (SMHI, 2019a, 2019b). The amount of precipitation falling when the temperature was above 0°C during winter (December, January, February) has also increased, especially at locations in the eastern lowlands toward the Baltic coast.

Results from a study of the impacts from rapidly changing weather and snow conditions on Laevas SRC show that rain-on-snow and high snow accumulation events are particularly disruptive, preventing access to lichens and inhibiting migration, respectively (Rosqvist et al., 2022). As a result, transport of trapped reindeer with trucks toward suitable pastures increases during times of weather-imposed stress and is sometimes necessary to complete migration past the centrally located hotspot of accumulated land use. Reindeer often disperse when snow conditions inhibit grazing in the mountains, which also requires a more frequent use of helicopters to locate and gather them. Due to more frequent land- and

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climate change-induced emergency situations there is an increasing need to supplementarily feed reindeer, a non-traditional practice that is both expensive and increases the risk of infectious diseases (Tryland et al., 2019; Horstkotte, Lépy, & Risvoll et al., 2020). The effects from accumulating land use and weather changes have now exerted so much pressure that the reindeer number of the Laevas SRC herd can only be maintained if fewer animals are being slaughtered, which results in loss of household income (Fohringer et al., 2021).

Reindeer herders have traditionally responded to weather-induced grazing limitations by employing flexible herding strategies, that is, by guiding their reindeer to alternative forests providing terricolous and/or arboreal lichens (Brännlund & Axelsson, 2011). This adaptive capacity needs to increase when climate warming continues (Berglöv et al., 2015; Meredith et al., 2019; Rosqvist et al., 2022). Instead, there is a high risk that this capacity will be reduced due to competing industrial land use in the eastern forested lowlands (Österlin, 2020).

Kemijoki: Cumulative Effects and Salmon Fishing

The Baltic salmon is a subspecies of Atlantic Salmon that forms an important part of coastal and riverine ecology in northern Fennoscandia. It is a "keystone species, providing irreplaceable ecosystem services in both marine and freshwater environments" (LaMere et al., 2020: 2). Salmon is also one of the traditional key resources for Sámi culture (Hiedanpää et al., 2020), and Baltic salmon fishing is one of the oldest traditional livelihoods in the area (Vilkuna, 1974) (Figure 5.1). Baltic salmon is still a very important natural resource for coastal and riverine settlements of the remaining unregulated rivers such as the Torne. The cumulative impacts of industrial and economic developments throughout the twentieth century have caused a decline in Baltic salmon stocks (HelCom, 2021).

The decline of the Baltic salmon stock was a result of almost simultaneously accumulating failures in open sea, offshore, and riverine management policies after the mid-twentieth century. One result was overfishing. The efficiency of fishing fleets increased, while at the same time the salmon stock was threatened by fish diseases, and hydropower development and concomitant inland developments endangered the spawning grounds of the Baltic salmon (Karlsson & Karlström, 1994; Romakkaniemi et al., 2003; LaMere et al., 2020). Throughout the Baltic Sea drainage area, approximately seventy rivers supported salmon spawning before its industrialization, with forty of these rivers located in Sweden and seventeen located in Finland (Karlsson & Karlström, 1994). After the expansion of hydropower and consequential destruction of habitats, only twenty-nine rivers flowing into the Baltic sea supported salmon spawning at the end of the twentieth century. Today, wild salmon only occur in fourteen rivers draining into the

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northernmost part of the Baltic Sea (ICES, 2020). Another cumulative impact source is the high nutrient (nitrogen and phosphorus) load from waste waters and upstream sources that are contributing to the overall eutrophication of the Baltic sea (HelCom, 2021). As a result of accumulated impacts, 80–85 percent of all Baltic salmon stock is reared and released from fish-farms, and only 15–20 percent originates from naturally spawning salmon (Coalition Clean Baltic, 2021). Here we focus particularly on how industrial development has resulted in devastating cumulative effects on salmon stocks in the Kemijoki catchment area and concomitant fishing traditions of riverine settlements.

Kemijoki has the largest catchment area in Finland that drains into the Baltic Sea. The catchment covers 51,127 square kilometers of a sparsely populated area (Figure 5.1). Numerous tributaries are regulated by hydropower plants, making it one of the most heavily regulated rivers in Arctic Fennoscandia. The lowest discharge typically occurs in winter when watercourses are frozen, and precipitation accumulates as snow. The highest discharge occurs during the spring thaw (HelCom, 2011a; Huusko et al., 2018), which also makes flood protection an important local issue.

Large-scale industrial development occurred after the second world war in the Lapland region of northern Finland. Industry and infrastructure were then rebuilt after the destruction caused by the retreating German army. The reparations payments to the Soviet Union speeded up the expansion of, for example, the timber industry. Impacts on terrestrial and aquatic ecosystems began to accumulate fast (Lähteenmäki, 2006). The Kemijoki and its tributaries had been used since the nineteenth century for timber floating (Vilkuna, 1974) but also the floating increased rapidly after the Second World War, which itself necessitated major changes, damming and dredging of rivers and rapids (HelCom, 2011b; Krause, 2011). However, salmon fishing – a very important traditional livelihood for centuries for riverine settlements, especially in a form of weir fishing (Figure 5.4) – continued despite the heavy disturbance caused by timber floating. For example, 184 weir fishing dams were documented in the Kemijoki system between 1869 and 1870, and the salmon catch could be up to 3,390 kilograms per day per weir (Vilkuna, 1974).

The overall expansion of economies necessitated improvements of infrastructure. The construction of hydropower plants along the Kemijoki from 1945 onward was particularly devastating for salmon and traditional weir fishing (Vilkuna, 1974). The need for hydropower was connected to the concomitant industrialization of Finland and particularly to the development of paper and pulp industry areas along the coast. The development of northern Finland was justified in a level of industrialization of the whole nation (Lähteenmäki, 2007). Large-scale harnessing of the majority of the river valley for industrialization led to emigration; for example, people from seven Sámi and Finnish villages had to move, and 750 reindeer grazing ranges and forty farms were flooded when two large

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Figure 5.4 Fishing weir in Kemijoki Tervola, 1922. Photo V. Jääskeläinen, Finnish Heritage Agency, Ethnographic Picture Collection, FINNA

reservoirs were built (Lähteenmäki, 2006). The establishment of the reservoirs were therefore particularly devastating for local reindeer herding (Magga, 2003). Disappointment for local habitants about the induced environmental changes resulted in a long struggle for a fish stocking obligation for the power companies, political movements for building fish ladders, and the so called rapid wars to save the last remaining free tributaries of Kemijoki (Suopajärvi, 2001; Krause, 2015).

Today the combined pressure exerted from human activities is very high in the Kemijoki catchment area. Salmon stocks are maintained by large annual compensatory release of hatchery-raised smolts by the power companies along the river (Romakkaniemi et al., 2003; Huusko, 2018). Since the 1980s, approximately "615,000 reared salmon have been stocked at the river mouth as a compensation for the lost wild reproduction" (HelCom, 2011a).

Future Outlook: Will Pressures Continue to Increase?

Reindeer and salmon are keystone species that require large, interconnected land- or seascapes in the form of a green/blue infrastructure. If these connections are

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broken, then reindeer and salmon, and the cultures and ecosystem functions that depend on them, will be negatively impacted. As reindeer and salmon are users of large geographic areas, they also bear the brunt of all the multiple pressures they are exposed to in these areas. In this chapter we have shown how the formation of industrial mega-systems has led to an accumulating appropriation of land and water areas that has reduced connectivity between ecosystems and the size of grazing and spawning areas. Which, in turn, have negatively impacted reindeer herding and salmon fishing, which are both also traditional livelihoods and bearers of local and indigenous cultures. However, assessments of impacts from industrial activities far too often singlehandedly focus on impacts on a project-by-project basis (Atlin & Gibson, 2017) rather than the aggregated cumulative effects over a larger area. To reindeer and salmon, the impact of just one industrial project, assessed in isolation, and often deemed by impact assessments as only causing minor disturbances (Rosqvist et al., 2023, see Chapter 6), is in reality not a minor impact when aggregated together with all other pressures.

With one of the largest mineral extraction sites in Europe located in the narrowest section of its hourglass-shaped pastures, the cumulative impacts in the Laevas SRC are unique. Still, the de-prioritization of reindeer herding in favor of extraction of minerals or hydropower is experienced in many places, and Laevas SRC is not alone in struggling with increasing pressure from industrial encroachments on pastures. Many reindeer herding communities in Sweden bear witness to how pressures are mounting (e.g., Lawrence & Larsen 2019; Österlin & Raitio 2020; Larsen et al., 2021). The story is the same also for reindeer herding communities in Norway (Lien, 2023, see Chapter 12) and Finland (e.g., Kivinen, 2015; Landauer et al., 2021) and also for Nenets in Arctic Russia (Forbes et al., 2009). The problems are in essence the same; traditional pastoralism developed in a landscape with a low degree of industrial impact now experiences increasing encroachments. As most types of industrial developments cause irreversible effects in terms of land conversion, the pressure is continuously accumulating. The effects of climate warming challenge reindeer across the Arctic, and regional weather patterns determine which parameters are most critical. Often a combination of changes in temperature and precipitation cause problems, for example, rain-on-snow events or heatwaves in summer causing droughts. Challenges are now mounting for reindeer herding communities because mitigation of and adaptation to changes in weather and snow demand high flexibility in reindeer land use, which is increasingly hampered by the expanding industrial footprint.

The ambition to reach carbon neutrality has inspired the governments of Sweden and Finland to promote generation of renewable energy, further mineral exploitation, and intensification of forestry in Arctic Fennoscandia. Building a low-carbon future is claimed to require minerals for production of batteries for electric vehicles, renewable energy sources, and new infrastructure developments

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(e.g., European Commission, 2018), which is now being implemented both in Finland and Sweden through various programs. To decrease import dependency from outside the EU there is an ambition to increase mining of “critical minerals” within the EU (European Commission, 2008). As northern Finland and Sweden constitute one of the core mining areas within the EU, it is very likely that the pressure to exploit more mineral resources in the region will continue to increase.

In Finland, further exploitation occurs in the Kemijoki catchment area, especially in the area around Sodankylä (Figure 6.1) where, for example, the Kevitsa copper and nickel mine has recently opened (Boliden AB), and the multi-metal Sakatti mine (Anglo-American Ltd) is under licensing procedures. Large scale wind power developments are emerging as well on the northern Finnish coast (Yle News, 2020; Finnish Wind Power Association, 2021). Therefore, pressures on riverine and coastal salmon stocks, and salmon fishing for livelihood and recreation, continue to increase.

Currently, there are several applications for mining concessions in permit processes in Sweden (e.g., Boliden Mineral AB for Laver K nr 1; Beowulf Mining Ltd for Kallak K nr 1 Permit issued March 22, 2022). Production of fossil-free steel is planned by “Hydrogen breakthrough Ironmaking Technology” and “H2 Green Steel” in the vicinity of Luleå . These new developments require large amounts of fossil-free energy, possibly produced by wind turbines placed on reindeer winter grazing areas. Thus, both future exploitation of minerals and production of fossil-free energy could continue to reduce the size of pastures and the connectivity between remaining pastures. We fear that predicted future climate changes, together with an increasing resource extraction and industrial developments will cause further and harmful cumulative effects on terrestrial and aquatic ecosystems in this region. Climate stress on reindeer will increase because climate scenarios predict higher temperatures and increased winter precipitation in Arctic Fennoscandia. By integrating experience-based and scientifically collected data, Rosqvist et al., (2022) showed high vulnerability of reindeer herding to further warming and that adaptation to especially severe snow conditions will be hindered by further exploitation of minerals and forests. Likewise, remaining salmon stocks are not only threatened by pollution and changes in hydro-regulation for energy production but also by higher water temperatures and climate change mitigation policies (Jonsson & Jonsson, 2009; LaMere et al., 2020). For example, Baltic cod is spreading northward in the Baltic Sea, possibly due to higher water temperatures, which may increase the predation pressure on salmon post-smolts (Friedland et al., 2017). Climate change mitigation policies, particularly policies for reducing the use of fossil fuels, may increase price peaks for hydropower as renewable energy. This may lead to hydropeaking – releasing of pulses of water to meet electricity demand – which may change behavior, mortality, and spawning of the Baltic salmon (Ashraf, 2020; LaMere et al., 2020).

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If the goal is to avoid, or at least mitigate, longlasting effects on the environment and people, the governments of Sweden and Finland need to ensure adequate assessments of cumulative effects from proposed industrial activities in order to be thoroughly informed before prioritizing between different potential futures. Potential impacts that may arise from industrial or societal projects on environment and people need to be assessed on appropriate temporal and spatial scales, including the total effects from climate change with the impacts following climate change mitigation policies. A more holistic perspective would allow decision-makers to keep a better balance between further resource exploitation and resilience of ecosystems such as, for example, those represented by reindeer and salmon.

Note

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References

Ashraf, F. (2020). *Changing river regimes: river regimes and energy demand interactions in Nordic rivers*. Acta Universitatis Ouluensis. C, 747. Oulu: University of Oulu.

Atlin, C. and Gibson, R. (2017). Lasting regional gains from non-renewable resource extraction: The role of sustainability-based cumulative effects assessment and regional planning for mining development in Canada. *The Extractive Industries and Society*, 4, 36–52. https://doi.org/10.1016/j.exis.2017.01.005

Avango, D., Lépy, É., Brännström, M., Heikkinen, H. I., Komu, T., Pashkevich, A., and Österlin, C. (2023). Heritage for the future: Narrating abandoned mining sites. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Avango, D., Kunnas, J., Pettersson, M., Pettersson, Ö., Roberts, P., Solbär, L., Warde, P., and Wråkberg, U. (2019). Constructing northern Fennoscandia as a mining region. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources*. London: Routledge, pp. 78–98. https://doi.org/10.4324/9781315174969-5

Berg, A., Östlund, L., Moen, J., and Olofsson, J. (2008). A century of logging and forestry in a reindeer herding area in northern Sweden. *Forest Ecology and Management*, 256 (5), 1009–1020. https://doi.org/10.1016/j.foreco.2008.06.003

Berglöv, G., Asp, M., Berggreen-Clausen, S., Björck, E., Axén Mårtensson, J., Nylén, L., Ohlsson, A., Persson, H., and Sjökvist, E. (2015). *Framtidsklimat i Norrbottens län – enligt RCP-scenarier*. Klimatologi, 32. Norrköping: SMHI.

Bidstrup, M., Kørnøv, L., and Partidário, M. R. (2016). Cumulative effects in strategic environmental assessment: The influence of plan boundaries. *Environmental Impact Assessment Review*, 57, 151–158. https://doi.org/10.1016/j.eiar.2015.12.003

Brännlund, I. and Axelsson, P. (2011). Reindeer management during the colonization of Sami lands: A long-term perspective of vulnerability and adaptation strategies. *Global Environmental Change*, 21(3), 1095–1105. https://doi.org/10.1016/j.gloenvcha.2011.03.005

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Bungard, G. (2021). *Resource Extraction and Sustainable Arctic Communities*. Stockholm: Bungard Film.

Byström, J. (2019). *Tourism Development in Resource Peripheries Conflicting and Unifying Spaces in Northern Sweden*. Umeå: Umeå University.

CAES, Circumpolar PhD network in Arctic Environmental Studies. (2002). *Reindeer as a Keystone Species in the North: Biological, Cultural and Socio-Economic Aspects*. Arctic Centre Reports 38. Rovaniemi: Arctic Centre, University of Lapland.

Chhabra, A., Geist, H., Houghton, R. A., Haberl, H., Braimoh, A. K., Vlek, P. L. G., Patz, J., Xu, J., Ramankutty, N., Coomes, O., and Lambin, E. F. (2006). Multiple Impacts of Land-Use/Cover Change. In E. F. Lambin and H. Geist, eds., *Land-Use and Land-Cover Change: Local Processes and Global Impacts*. Berlin: Springer, pp. 71–116. https://doi.org/10.1007/3-540-32202-7_4

Coalition Clean Baltic. (2021). Website. https://ccb.se/

European Commission. (2008). The raw materials initiative: Meeting our critical needs for growth and jobs in Europe {SEC(2008) 2741}. Online report. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0699:FIN:en:PDF

European Commission. (2018). *A Sustainable Bioeconomy for Europe: Strengthening the Connection between Economy, Society and the Environment Bioeconomy Strategy*, Luxembourg: Publications Office of the European Union.

Finnish Wind Power Association. (2021). Wind power projects in Finland. Online map. https://tuulivoimayhdistys.fi/en/wind-power-in-finland/map

Fohringer, C., Rosqvist, G., Inga, N., and Singh, N. J. (2021). Reindeer husbandry in peril? How extractive industries exert multiple pressures on an Arctic pastoral ecosystem. *People and Nature*, 3, 872–886. https://doi.org/10.1002/pan3.10234

Forbes, B. C. and Kumpula, T. (2009). The ecological role and geography of reindeer (Rangifer tarandus) in northern Eurasia. *Geography Compass*, 3(4), 1356–1380. https://doi.org/10.1111/j.1749-8198.2009.00250

Friedland K. D., Dannewitz J., Romakkaniemi A., Palm S., Pulkkinen H., Pakarinen T., and Oeberst R. (2017). Post-smolt survival of Baltic salmon in context to changing environmental conditions and predators. *ICES Journal of Marine Science*, 74(5), 1344–1355. https://doi.org/10.1093/icesjms/fsw178

Hansson, S. (1998). Malm, räls och elektricitet: skapandet av ett teknologiskt megasystem i Norrbotten 1880-1920. In P. Blomkvist and A. Kaijser, eds., *Den konstruerade världen: tekniska system i historiskt perspektiv*. Eslöv: B. Östlings bokförlag, pp. 45–76.

Hansson, S. (2006). Technology and social change: A technological megasystem in the North of Sweden. In L. Elenius, ed., *Migration, Industrialisation and Regionalisation: The Use and Abuse of History in the Barents Region II*. Luleå: Luleå University of Technology, pp. 20–31.

Heggberget, T. M., Gaare, E., and Ball, J. P . (2002). Reindeer (Rangifer tarandus) and climate change: Importance of winter forage. *Rangifer*, 22(1), 13–31. https://doi.org/10.7557/2.22.1.388

HelCom. (2011a). *Salmon and Sea Trout Populations and Rivers in Finland: HELCOM Assessment of Salmon (Salmo salar) and Sea Trout (Salmo trutta) Populations and Habitats in Rivers Flowing to the Baltic Sea*. Balt. Sea Environ. Proc. No. 126B. Helsinki; Helsinki Commission.

HelCom. (2011b). *Salmon and Sea Trout Populations and Rivers in the Baltic Sea: HELCOM Assessment of Salmon (Salmo salar) and Sea Trout (Salmo trutta) Populations and Habitats in Rivers Flowing to the Baltic Sea*. Balt. Sea Environ. Proc. No. 126A. Helsinki; Helsinki Commission.

HelCom. (2021). Helsinki Commission. Website. https://helcom.fi/

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Hiedanpää, J., Saijets, J., Jounela, P., Jokinen, M., and Sarkki, S. (2020). Beliefs in conflict: The management of Teno Atlantic salmon in the Sámi homeland in Finland. *Environmental Management*, 66, 1039–1058. https://doi.org/10.1007/s00267–020-01374-6

Holsman, K., Samhouri, J., Cook, G., Hazen, E., Olsen, E., Dillard, M., Kasperski, S., Gaichas, S., Kelble, C. R., Fogarty, M., and Andrews, K. (2017). An ecosystem-based approach to marine risk assessment. *Ecosystem Health and Sustainability*, 3(1), e01256. https://doi.org/10.1002/ehs2.1256

Horstkotte, T. and Moen, J. (2019). Successional pathways of terrestrial lichens in changing Swedish boreal forests. *Forest Ecology and Management*, 453, 117572. https://doi.org/10.1016/j.foreco.2019.117572

Horstkotte, T., Lépy, É., Risvoll, C. et al. (2020). *Supplementary Feeding in Reindeer Husbandry – Results from a Workshop with Reindeer Herders and Researchers from Norway, Sweden and Finland*. Ume å: Umeå University. www.umu.se/globalassets/organisation/utan-fakultetstillhorighet/arktiskt-centrum-vid-umea-universitet/arctic-publications/supplementary-feeding-report_eng.pdf

Huusko, R. (2018). *Downstream Migration of Salmon Smolts in Regulated Rivers: Factors Affecting Survival and Behaviour*. Acta Universitatis Ouluensis. C, 709. Oulu: University of Oulu.

Huusko, R., Hyvärinen, P., Jaukkuri, M., Mäki-Petäys, A., Orell, P., and Erkinaro, J. (2018). Survival and migration speed of radio-tagged Atlantic salmon (*Salmo salar*) smolts in two large rivers: One without and one with dams. *Canadian Journal of Fisheries & Aquatic Sciences*, 75, 1177–1184. https://doi.org/10.1139/cjfas-2017-0134

ICES, International Council for the Exploration of the Sea. (2020). Atlantic salmon (*Salmo salar*) in subdivisions 22–31 (Baltic Sea, excluding the Gulf of Finland), Online publication. https://doi.org/10.17895/ices.advice.5900

IPBES, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). *Summary for Policymakers of the Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Bonn: IPBES Secretariat. https://doi.org/10.5281/zenodo.3553579

Jääskeläinen, V. (1922). Housun kalapato Kemijoessa. Online photograph collection of Finnish Heritage Agency. https://museovirasto.finna.fi/Record/museovirasto.079C5127A8C648BDECA4EC8FDC789DA7?lng=en-gb

Jones, F. C. (2016). Cumulative effects assessment: Theoretical underpinnings and big problems. *Environmental Reviews*, 24(2), 187–204. https://doi.org/10.1139/er-2015-0073

Jonsson, B. and Jonsson, N. (2009). A review of the likely effects of climate change on anadromous Atlantic salmon *Salmo salar* and brown trout *Salmo trutta*, with particular reference to water temperature and flow. *Journal of Fish Biology*, 75, 2381–2447, https://doi.org/10.1111/j.1095-8649.2009.02380.x

Karlsson, L. and Karlström, Ö. (1994). The Baltic Salmon (*Salmo salar* L.): Its history, present situation and future. *Dana*, 10, 61–85.

Kivinen, S. (2015). Many a little makes a mickle: Cumulative land cover changes and traditional land use in the Kyrö reindeer herding district, northern Finland. *Applied Geography*, 63, 204–211. https://doi.org/10.1016/j.apgeog.2015.06.013

Kivinen, S., Berg, A., Moen, J., Östlund L. , and Olofsson, J. (2012). Forest fragmentation and landscape transformation in a reindeer husbandry area in Sweden. *Environmental Management*, 49(2), 295–304. http://dx.doi.org/10.1007/s00267–011-9788-z

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Krause, F. (2011). Shaping and reshaping the Kemi River: Notes on the perpetual genesis of the major catchment basin in Finnish Lapland. In M. Nuttall, H. Strauss, and K. Tervo-Kankare, eds., *Society, Environment and Place in Northern Regions*. Oulu: University of Oulu, Thule Institute, pp. 27–45.

Krause, F. (2015). Making a reservoir: Heterogeneous engineering on the Kemi River in Finnish Lapland. *Geoforum*, 66, 115–125. https://dx.doi.org/10.1016/j.geoforum.2014.09.002

LaMere, K., Mäntyniemi, S., and Haapasaari, P. (2020). The effects of climate change on Baltic salmon: Framing the problem in collaboration with expert stakeholders. *Science of the Total Environment*, 738. https://doi.org/10.1016/j.scitotenv.2020.140068

Landauer, M., Rasmus, S., and Forbes, B. C. (2021). What drives reindeer management in Finland towards social and ecological tipping points? *Regional Environmental Change*, 21(32). https://doi.org/10.1007/s10113–021-01757-3

Larsen, R. K., Boström, M., and Muonio sameby (2021).”De kör över en ändå … ”: Konsekvenser av gruvan i Kaunisvaara för Muonio sameby. SEI Working Paper. Stockholm Environment Institute. https://doi.org/10.51414/sei2021.002

Lawrence, R. and Larsen, R. K. (2019). Fighting to be herd Impacts of the proposed Boliden copper mine in Laver, Älvsbyn, Sweden for the Semisjaur Njarg Sami reindeer herding community. Online article. www.sei.org/publications/fighting-to-be-herd-impacts-copper-mine-sami/

Lien, M. E. (2023). Beyond mining: Repair and reconciliation. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Lähteenmäki, M. (2006). The fur hat delegation: The harnessing of the Kemi River and the regional development of Lapland from the 1950s to the 1970s. In L. Elenius, ed., *Migration-Industrialisation-Regionalisation: The Use and Abuse of History in the Barents Region II*. Studies in Northern European Histories 2. Luleå: Luleå University of Technology, pp. 122–132.

Lähteenmäki, M. (2007). Industrialisation process in Finnish Lapland after the Second World War. In L. Elenius, ed., *The Industrialisation Process in the Barents Region*. Studies in Northern European Histories 3. Luleå: Luleå University of Technology, pp. 182–196.

Magga, H. (2003). Poronhoidon menetykset ja sopeuttaminen suuriin ympäristömuutoksiin Lapin paliskunnassa 1950-luvulta lähtien. In H. Heikkinen, ed., *Kuuluuko sääsken ääni taivaaseen? Poromiesten analyysi poronhoidon murroksista Suomen Lapissa 1900-luvulla*. Technology, society, environment 3/2003. Espoo: Helsinki University of Technology, pp. 11–78.

Meredith, M., Sommerkorn, M., Cassotta, S., Derksen, C., Ekaykin, A., Hollowed, A., Kofinas, G., Mackintosh, A., Melbourne-Thomas, J., Muelbert, M. M. C., Ottersen, G., Pritchard, H., and Schuur, E. A. G. (2019). Polar Regions. In H-O. Pörtner, D. C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, and N. M. Weyer, eds., IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, pp. 203–320. www.ipcc.ch/site/assets/uploads/sites/3/2019/12/SROCC_FullReport_FINAL.pdf

Oesterwind, D., Rau, A., and Zaiko, A. (2016). Drivers and pressures: Untangling the terms commonly used in marine science and policy. *Journal of Environmental Management*, 181, 8–15. https://doi.org/10.1016/j.jenvman.2016.05.058

Össbo, Å. (2014). *Nya vatten, dunkla speglingar: Industriell kolonialism genom svensk vattenkraftutbyggnad i renskötselområdet 1910–1968*. Umeå: Umeå University.

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Österlin, C. and Raitio, K. (2020). Fragmented landscapes and planscapes: The double pressure of increasing natural resource exploitation on Indigenous Sámi lands in Northern Sweden. *Resources*, 9(104), 104. https://doi.org/10.3390/resources9090104

Österlin, C. (2020). *Nature Conservation, Landscape Change and Indigenous Rights: The Role of Sámi Reindeer Herding for Environmental Objectives in the Swedish Mountain Landscape*. Doctoral Dissertation. Stockholm: Department of Physical Geography, Stockholm University.

Polfus, J. L., Hebblewhite, M., and Heinemever, K. (2011). Identifying indirect habitat loss and avoidance of human infrastructure by northern mountain woodland caribou. *Biological Conservation*, 144, 2637–2646. https://doi.org/10.1016/j.biocon.2011.07.023

Romakkaniemi, A., Perä, I., Karlsson, L., Jutila, E., Carlsson, U., and Pakarinen, T. (2003). Development of wild Atlantic salmon stocks in the rivers of the northern Baltic Sea in response to management measures. *ICES Journal of Marine Science*, 60(2), 329–342. https://doi.org/10.1016/S1054–3139(03)00020-1

Rosqvist, G., Inga, N., and Eriksson, P. (2022) Impacts of climate warming on reindeer herding require new land-use strategies. *Ambio* 51, 1247–1262. https://doi.org/10.1007/s13280-021-01655-2

Rosqvist. G., Heikkinen, H. I., Suopajärvi, L., and Österlin, C. (2023). How should impacts be assessed? In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Sandström, C., Moen, J., Widmark, C., and Danell, Ö. (2006). Progressing toward co-management through collaborative learning: Forestry and reindeer husbandry in dialogue. *International Journal of Biodiversity Science*, 2, 326–333. https://doi.org/10.1080/17451590609618153

Suopajärvi, L. (2001). *Vuotos- ja Ounasjoki-kamppailujen kentät ja merkitykset Lapissa. Acta Universitatis Lapponiensis*. Rovaniemi: Lapin Yliopisto.

SMHI, Swedish Meteorological and Hydrological Institute. (2019a). Nederbörd. Website. www.smhi.se/data/meteorologi/nederbord

SMHI, Swedish Meteorological and Hydrological Institute. (2019b). Temperatur. Website. www.smhi.se/data/meteorologi/temperatur

Tryland, M., Nymo, I. H., Sánchez Romano, J., Mørk, T., Klein, J., and Rockström, U. (2019). Infectious disease outbreak associated with supplementary feeding of semi-domesticated Reindeer. *Frontiers in Veterinary Science*, 6, 126. https://doi.org/10.3389/fvets.2019.00126

Turunen, M. T., Rasmus, S., Bavay, M., Ruosteenoja, K., and Heiskanen, J. (2016). Coping with difficult weather and snow conditions: Reindeer herders' views on climate change impacts and coping strategies. *Climate Risk Management*, 11, 15–36. https://doi.org/10.1016/j.crm.2016.01.002

Tyler, N. J. C., Hanssen-Bauer, I., Førland, E. J., and Nellemann, C. (2021). The Shrinking Resource Base of Pastoralism: Saami Reindeer Husbandry in a Climate of Change. *Frontiers in Sustainable Food Systems*. https://doi.org/10.3389/fsufs.2020.585685

Vilkuna, K. (1974). *Lohi: Kemijoen ja sen lähialueen lohenkalastuksen historia*. Helsinki: Otava.

Yle News. (2020). Finland aims to boost wind power by leasing more state land for construction. Yle News article. https://yle.fi/uutiset/osasto/news/finland_aims_to_boost_wind_power_by_leasing_more_state_land_for_construction/11344455

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6

How Should Impacts Be Assessed?

GUNHILD ROSQVIST, HANNU I. HEIKKINEN, LEENA SUOPAJÄRVI[1], CARL ÖSTERLIN[2]

Industrial development and resource exploitation in Arctic Fennoscandia cause cascading and cumulative effects with roots that go back to mining in the late nineteenth century (Österlin et al., 2023, see Chapter 5). Mining of iron, copper, and other minerals and metals is a major industry today in northern Sweden and Finland. The increasing demand for minerals and metals to facilitate a "green transition" is a challenge for environmental management but also comes with social impacts. Indigenous and local Arctic communities are highly dependent on the natural environment for their livelihoods, which are now at risk because of the effects of resource extraction and climate change. In this chapter we discuss limitations of the current impact assessment procedures in this resource-rich region. We also present local attempts to provide additional knowledge and understanding of the full impact from multiple human activities beyond conventional corporate-led impact assessments needed for sustainable land use management.

Impact assessment (IA) is a process used to consider the implications for the environment and people of proposed human actions (International Association of Impact Assessment, 2021). The terms "impact" and "effect" are frequently used synonymously. The concept of "environment" in IA evolved from an initial focus on the biophysical components to a wider definition, including the physical-chemical, biological, cultural, and socio-economic components of the total environment. In order to predict expected future consequences of possible decisions, the practice of IA needs to rely on several tools based on both natural and social sciences. However, IAs are not assessments of impacts in the true sense of the word, as at the time of assessments there are no impacts to assess. Their ontology is more like that of a hypothesis, with estimates, models, and future scenarios presented based on selected elements of current knowledge (Suopajärvi, 2013; Olofsson, 2020). The results from the theoretical assessment approaches are

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then "tested" in the real world "living laboratories." Social impacts are, by definition, expected or unexpected (Vanclay, 2002, 2003; Vanclay et al., 2015).

The most established aspect of IA is the Environmental Impact Assessment (EIA), which is defined by the International Association of Impact Assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals" (IAIA, 2021). Today, EIA is the main legally based tool used to predict impacts on environment and communities of individual industrial projects, regardless of whether they are in the field of mining, infrastructure construction, or energy production (e.g., Glasson & Thierval, 2019; Euroepan Union (EU) Directive 2001/42/EC). In contrast, forestry does not require any assessment of impacts in Sweden and Finland.

The EIA directive of the (EU) is implemented by EIA Law (252/2017) and Decree (2017/277) in Finland. In Sweden, the EIA Directive is implemented by the Environmental Code (SFS 1998:808) and the Ordinance on Environmental Impact Assessments (SFS 1998:905). In general, the EIA legislation of both countries follows the wording of the EIA directive of EU with its amendments (e.g., Directive 2014/52/EU, article 3). It states that:

> The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors: (a) population and human health; (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC; (c) land, soil, water, air and climate; (d) material assets, cultural heritage and the landscape; (e) the interaction between the factors referred to in points (a) to (d).

The "polluter pays" principle is applied in the EIA legislation, and the company applying for a permit for resource extraction or construction has the leading role in assessing impacts resulting from the proposed activities, typically by contracting a consultancy for assessment.

Both the EU-level EIA directive and national laws are unclear about how cumulative effects should be assessed and what should be included in assessments of social impacts (EU Directive 2001/42/EC). Cumulative effects typically refer to changes to the environment and people that are caused by the combined impact of past, present, and future human activities and natural processes (Duinker et al, 2013). Even if the EIA legislation recognizes many kinds of impacts on humans, Social Impact Assessments (SIA) have often been limited and focused on predicted, and at times even wishful, impacts on employment and economic benefits (Suopajärvi, 2013). In addition, the requirements for how cumulative effects should be assessed, especially effects on Indigenous communities, have been criticized for being unclear and even "non-existent" in Sweden (Raitio, Allard, & Lawrence, 2020: 12).

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Large-scale spatial planning is primarily conducted through two planning instruments in Sweden, the "Comprehensive plans" (Planning and Building Act 2010:900) and "Areas of national importance" (Environmental Code 1998:808 chap 3 & 4). Comprehensive plans are established by municipalities to provide long-term strategic guidance on how land and water resources should be used. There are fourteen categories of "Areas of national importance," and these are appointed by twelve different governmental agencies, for example the Energy Agency, the Environmental Protection Agency, and the Sámi Parliament with the intention to safeguard access to land for particular sectorial interests. For example, areas can be appointed for nature protection, mineral resources, energy generation, and reindeer herding. When "Areas of national interest" overlap, priorities among them are made at the municipal level or in the local environmental courts.

In Finland, land use planning is controlled and reconciled mainly through a procedure complying with the Land Use and Building Act (132/1999). The act is connected to other legislation originating from the Constitution of Finland (731/1999), which sets the fundamental responsibilities and rights to participate in decision making toward one's living environment, and which is supplemented by the EIA directive of the European Union (Kokko et al., 2014: 9–17). Land use planning is conducted by public authorities such as municipalities and regional councils supervised by governmental bodies such as the Centre for Economic Development, Transport and the Environment (ELY centers), and the Ministry of the Environment (2021). There are three main levels of land use planning in Finland; (1) the Government decision on Finland's national land use guidelines, (2) the Regional plan and land use planning, which includes the regional scheme, the regional plan, and the regional development program, and (3) the land use strategies and programs within the municipality where a local master plan and a local detailed plan, land policy, and building ordinance are the most important (Ministry of the Environment of Finland, 2021).

Local Initiatives to Improve Impact Management

Accumulation of impacts over time in Arctic Fennoscandia is caused by the long-term exposure to multiple industrial cycles. The impact assessment process follows the polluter pays principle, where the developer of individual projects is responsible for including an EIA in their permit application to the regulating authorities. Thus, assessments of impacts from new industrial projects mainly focus on near future direct impacts from single projects (e.g., Atlin & Gibson, 2017) without considering the accumulation of effects over time or interaction with effects resulting from other human activities or natural processes. Next in this chapter we present examples of local initiatives (Figure 6.1) in response to the poor

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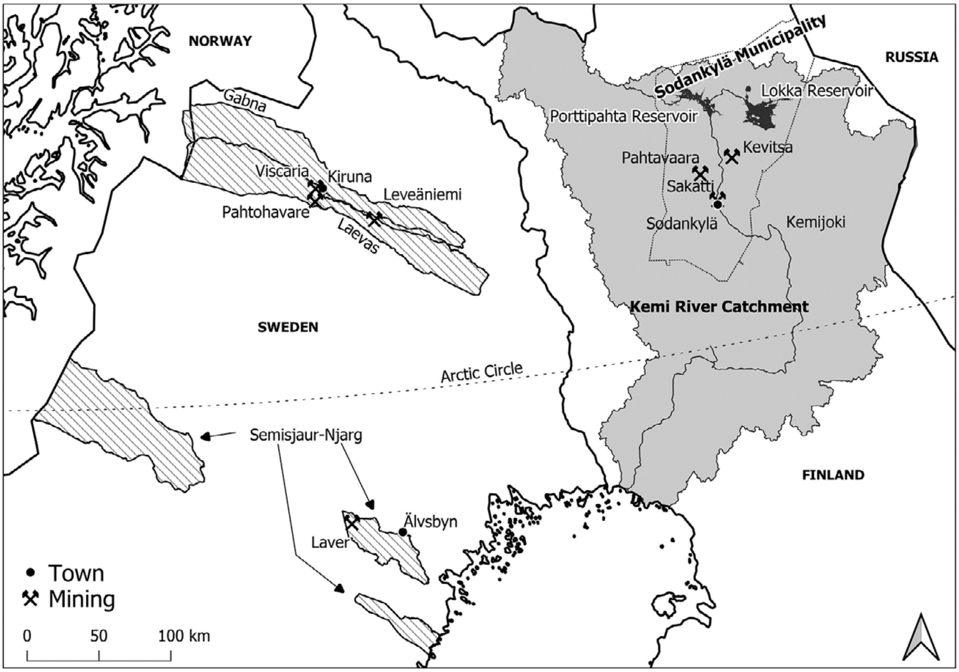

Figure 6.1 Overview of Arctic Fennoscandia and the location of sites mentioned in the text. Drawn by Carl Österlin

performance of the legally binding IA processes, especially the dissatisfactory management of cumulative effects and lack of inclusion of local knowledge in the process (Karvinen & Rantakallio, 2019).

With the aim to reveal the full range of impacts from industrial developments on their livelihood, Laevas, Gabna, and Semisjaur-Njarg Sámi reindeer herding communities (SRC) in Sweden produced their own assessment of cumulative effects based on detailed analysis of their land use needs, so-called reindeer herding analyses (Nilsson et al., 2014; Larsen, 2018; Nilsson & Blom, 2018). The need for this kind of assessment of locally accumulating land use disturbances is also a sign of poor functioning of national and regional level land use planning instruments. However, the municipal level is a very important local land use planning forum. In principle, municipalities may try to control their own economic development via, for example, local detailed plans. Our case example from Sodankylä municipality in Finland, which covers 12,415 square kilometers and has a population of 8,243 people and a population density of 0.7 inhabitants per square kilometer, will exemplify how challenging it may be to control its own fate in the real world with multiple historical and concomitant developments (Österlin et al., 2023, see Chapter 5). To fully understand and manage the multiple pressures from

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cumulative impacts by new industrial projects, Sodankylä municipality included local stakeholders, representatives from mining companies, and scientists in a participatory process with the aim to co-produce a Social Impact Management plan (SIMP), which forms our second major case (Sodankylä Municipality, 2018).

Cumulative Effects on Reindeer Herding

A particular concern for reindeer herding communities in Arctic Fennoscandia has been how mining activities interact and add on to effects from other types of resource exploitation such as forestry and energy production. To assess the impacts of mining on reindeer land use, specific reindeer herding analyses have in a few cases been included in EIAs for mining projects in northern Sweden. So far, these have been conducted on a voluntary basis as their inclusion is not mandatory. Yet, the results from these voluntary corporate assessments have so far not resulted in proper acknowledgment of cumulative effects on reindeer herding (Larsen, 2018). As a response, members of SRCs have conducted their own analyses with the aim to estimate impacts from new mining projects and the cumulative impacts from all types of land use change. Here, we present two such efforts by the SRCs Laevas, Gabna, and Semisjaur-Njarg (Figure 6.1).

The development of the mining industry and the growth of associated infrastructure and urbanization around Kiruna have resulted in a significant reduction of the grazing areas used by Laevas and Gabna SRCs (Fohringer et al., 2021), and they therefore conducted a series of community-led assessments of cumulative impacts on their pastures. They produced a handbook (LKAB, Laevas, & Gabna samebyar, 2015) on how to best assess cumulative effects on reindeer herding in collaboration with representatives from the state-owned mining company Loussavaara Kiirunavaara Aktiebolag (LKAB), which operates the majority of mines in the Kiruna area. They also conducted an impact assessment of one specific mining exploitation at Leveäniemi, forty kilometers south-east of Kiruna (Nilsson et al., 2014) and a larger assessment of cumulative impacts (Nilsson & Blom, 2018) on the lands used by both Laevas and Gabna SRCs. These assessments included mapping of previous extraction sites (mines, quarries), transport infrastructure (railroads, roads), wind turbines, power lines, and facilities for tourism, as well as disturbance zones around these activities (Skarin & Åhman, 2014).

The results show that additional encroachments from industrial activities would have serious direct and indirect environmental and social impacts (Table 6.1) and revealed a high vulnerability to further loss of winter grazing areas and interruptions of migration routes. Laevas and Gabna SRCs also raise concern over increased dependency on supplementary feeding as this may threaten animal welfare (Tryland et al., 2019; Horstkotte, Lépy, & Risvoll, 2020).

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Table 6.1. *Direct and indirect environmental and social impacts on reindeer herding in Laevas SRC from a proposed mine in Leveäniemi according to Nilsson et al. (2014)*

Direct effect	Indirect effect	Economic/social/ cultural impact
Loss of grazing areas	Increased pressure on remaining winter grazing areas and winter groups. Grazing areas can then only support the herd for a shorter period of time; therefore, the mountainous grazing areas need to be used more and cause more grazing pressure there	Potential need to reduce the number of reindeers Potential need to reduce the number of reindeers
Loss of migration routes	(not stated)	(not stated)
Loss of resting pastures	(not stated)	(not stated)
Increase in number of traffic accidents	(not stated)	Reduced herd size Loss of income
Re-routing of snow mobile tracks	New tracks contribute to disperse reindeer	Increased workload to prevent dispersal and keep the herd gathered
New powerlines reduce grazing areas	Powerline clearings tend to be used as snowmobile tracks that further disperse reindeer	Increased workload to prevent dispersal and keep the herd gathered
Pollution from mineral dust	(not stated)	(not stated)

Their main conclusion is that if industrial area expansion continues, traditional reindeer herding practice, that is, freely grazing animals seasonally migrating between pastures, is impeded. A quote captures the problem at hand: “Grazing areas is a critical resource for the SRC and when grazing areas shrink and alternative pastures disappears, then the possibility to adapt disappears too” (Nilsson et al., 2014: 13). Some 350 kilometers further south, reindeer herders from Semisjaur-Njarg SRC oppose the potential opening of the, so far, largest open-pit copper mine in Sweden. Here the mining company Boliden AB has applied for a permit to develop the Laver mine, which is located close to Älvsbyn (Figure 6.1) (Avango et al., 2023, see Chapter 10). Due to the prospect of drastically negative effects on reindeer and discontent from the SRC with the assessment of effects on reindeer herding in the corporate-led EIA by Lindeström and Eriksson (2014), Semisjaur-Njarg SRC conducted a detailed reindeer herding

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analysis with support from scientists specializing in impact assessments (Lawrence & Larsen, 2016). The baseline information, including the sum of existing encroachments in their winter grazing pastures, was derived through a mapping exercise. Subsequently, assessments of impacts from the mining were made for two scenarios: (1) the mining project is not realized or (2) the proposed new Laver copper mine is realized. Results show that even if pressure would continue from cumulative impacts from, for example, forestry and predators in the no-mine scenario, the SRC at least stand a chance to adapt and continue with traditional reindeer herding in the area. If the mine opens they would lose access to the fenced-off mining area (46 square kilometers) and lose connectivity between remaining grazing grounds, which in turn will lead to large areas becoming functionally unavailable (Lawrence & Larsen, 2016). New mining-associated infrastructure, for example, roads and powerlines, would add further pressure, making it impossible to practice traditional reindeer herding. Just like the herders from Gabna and Laevas SRCs, herders from Semisjaur-Njarg SRC would have to rely heavily on supplementary feeding – with a risk of ending up as "reindeer farmers" (Lawrence & Larsen, 2016). Thus their main conclusion is that the cumulative effects would hinder traditional reindeer herding if the mining project is realized, a conclusion that was strongly contested by Boliden AB, as they claimed that the analysis was "subjective and thus invalid" (Lawrence & Larsen, 2016; Lawrence & Larsen, 2017: 1175).

The main advantage with community-led impact assessments, besides being led by the actor with the most detailed knowledge, is the ability to circumvent corporate unwillingness to reveal the full impacts of a proposed project as these would risk being unfavorable. The results from the impact assessment of the Leveäniemi mining project by Laevas and Gabna SRCs (Nilsson et al., 2014) resulted in financial support from the company LKAB for mitigation measures to aid reindeer herding in the area, such as new coralls and fences. The information provided was, however, not considered important enough to hinder other mining ventures. For example, a major step toward opening a copper mine, strategically located in a key area for Laevas and Gabna SRCs, was taken when Copperstone Resources AB recently was granted a mining concession (Viscaria K. nr 7). In addition, a re-opening of the Pahtohavare mine (Lovisagruvan), which has been closed since 1997, is now being discussed (Lovisagruvan, 2021). Additional mining activities in this still "open" narrow corridor just south of the LKAB Kiruna mines would hinder reindeer migration between summer and winter pastures. For Semisjaur-Njarg it is yet too early to tell whether the community-led IA will influence land use planning as no final decision has been made regarding the Boliden AB permit application for the Laver mine. However, Boliden's fierce contestation of the community-led impact assessment suggests that it is an unwelcome initiative. This is perhaps no surprise since it portrays the potential impacts from the proposed mining site as far more severe than described in the corporate-led EIA (Lindeström & Eriksson, 2014).

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The Sodankylä Social Impact Management Plan

Sodankylä municipality, which is sparsely populated and rurally located in the Kemijoki river catchment in northern Finland, is an example *par excellence* of an Arctic resource-rich region lacking control of its fate and future (Figure 6.1) (Dahl et al., 2010). Here, several large-scale mining and hydro-power projects have significantly impacted environment and people over recent decades. Forestry, pulp mills, and the paper industry were the main industrial activities in Finland after the Second World War. The large northern forests provided timber for the industry and local employment (Donner-Amnell, 1991), and forestry intensified in the Sodankylä area. Development for hydro-power also started in the Kemijoki catchment (Österlin et al., 2023, see Chapter 5). The large Lokka and Porttipahta reservoirs, and six hydro-power plants harnessing the River Kitinen, which is a tributary of Kemijoki, are located in Sodankylä municipality. From the local point of view, this period of "hyper-extractivism" (Sörlin, 2023, see Chapter 1) provided employment and opportunities for local development – the "glory days" of rising living standards and rapid transition to a modern lifestyle with all its amenities. However, due to mechanization, the importance of forestry for local employment and economy declined rapidly from the 1980s onward (Rannikko, 2010). Also, automated hydro-power production provided far fewer work opportunities for locals compared to the construction phase. As a result, unemployment was high, and population declined when the new millennium began.

The most recent "mining boom" in Arctic Fennoscandia, which began in the early 2000s, changed prospects in Sodankylä. The municipality is situated in the mineral-rich central Lapland green stone belt (Sarala, 2010), where the Canadian company First Quantum Minerals opened the Kevitsa multi-metal mine in 2012, which was sold to the Swedish company Boliden AB in 2016 (Hietala, Syväjärvi, & Mauno, 2015). In addition, AA Sakatti Mining (part of Anglo American) began their EIA procedure for mining of copper, nickel, and platinum in 2017, a process still ongoing in 2021. Activities resulting from the Sakatti mining project will most likely impact the Viiankiaapa mire, protected by the EU-wide Natura 2000 nature conservation program (Metsähallitus, 2018) and increase demands on the EIA. According to the consultant company, the mining project will increase employment and result in general positive economic development in the region during the construction and operation phases (Ramboll, 2020). Several other companies have also prospected for minerals and precious metals such as gold and copper in the Sodankylä region (Sarala, 2010).

Currently, there are several mining projects in different stages of exploration, development, and operation in Sodankylä. In contrast, the economy of the Pahtavaara gold mine, which was opened in 1996 by the Terra Mining company, is faltering (Rupert Resources, 2021). Thus, mines are wicked possibilities for many

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host communities, and their prosperity depends on fluctuations on the global markets (Suopajärvi & Kantola, 2020). Adaptation to industrial development that occurs in boom-and-bust cycles is especially challenging for small communities (Lockie, 2009; Suopajärvi & Kantola, 2020). The social impacts of mining projects and their associated need of infrastructure, provision of services, and housing represented immense opportunities as well as a considerable challenge for Sodankylä municipality. For example, when First Quantum Minerals reported on economic problems and wanted to sell the Kevitsa mine, it was feared that the mine would be closed for good and the investments and hopes for future prosperity in Sodankylä lost (Hietala et al., 2015).

Using the three-pillar conception of sustainability (social, economic, and environmental) as a reference, the mining companies are responsible for economic viability of their specific businesses, and the authorities should monitor compliance with environmental standards. However, when it comes to social impacts of large-scale industrial development of one extractive sector, there is not a single actor nor mechanism in place to ensure social sustainability (Suopajärvi & Kantola, 2020). As a response, Sodankylä municipality therefore decided to develop a SIMP, which included assessment, monitoring, and managing of diverse social consequences from mining (Franks et al., 2010; Vanclay & Esteves, 2011; Franks & Vanclay, 2013). This unique initiative was funded by the Regional Innovation in the Nordic Arctic and Scotland (REGINA) project, which was in operation from 2015 to 2018 with a special focus on regions with large-scale industrial projects. Sodankylä municipality and the University of Lapland at Rovaniemi were the project's Finnish partners (Nordregio, 2015). Representatives from Sodankylä municipality led the process, and scientists conducted two surveys on the impacts of mining (Kuisma & Suopajärvi, 2017; Saariniemi, 2018).

After the baseline analyses of the socio-economic situation of the municipality (Kantola, 2016), three workshops with large stakeholder involvement were organized in 2016 and 2017. In total, forty representatives participated from the tourism industry, reindeer herding communities, different municipal sectoral units, the mineral industry, and third sector organizations, such as village associations. Several small organizations and micro-entrepreneurs, with limited resources and workforce, were not able to participate in the workshops that were organized during daytime. Participants agreed that the collaborative planning process was valuable, as such, because it provided an opportunity to hear and discuss conflicting opinions.

The explicit goal of the SIMP was to foster sustainable mining benefits to the local community: "The main principle is that Sodankylä municipality encourages and promotes cooperation with mining projects if and when in advance demonstrated by impact assessments and relevant research findings that the

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project benefits the local community and that the risks can be accepted in short and long term by the local community" (Sodankylä Municipality, 2018: 4). The program included goals, action plans, and indicators for the three pillars of sustainability. For example, social sustainability goals included themes like increased welfare and local cultural development, and the action plan for social sustainability included support for new inhabitants to settle in the municipality and improved housing and accommodation. The program also included an idea of continuing the SIMP process by facilitation of a "Local Mining Forum" for impact follow-up, needed actions for problem solving as well as actions for supporting sustainable solutions on the municipality level together with stakeholders and industry (Sodankylä Municipality, 2018).

In 2021, the last year of the program period, not much happened, and problems related to mining developments remain the same. The housing stock is old, and housing is expensive, even hindering the miners and their families from settling in the municipality. Traffic safety due to mining-related transportation is still experienced as a serious problem. The idea of the "Local Mining Forum" has not been developed further. On the other hand, mining companies took the initiative at the end of 2020 to make the third follow-up study of experienced impacts (Tulilehto & Suopajärvi, 2021). However, as the range of social impacts included was very wide, for example, spanning broad themes like wellbeing or population development and more specific questions related to organization of public and private services or traffic safety, decisions may not necessarily be in the hands of either the municipality or mining companies. For example, construction of new rental housing in the area is in the hands of private investors.

There are many possible reasons for the failure to implement the SIMP. It was initiated and coordinated by the short fixed-term research and development (R&D) REGINA project. It became a challenge for the small community with restricted monetary and personnel resources to continue to run the program after the external funding had ceased. Another reason was that the private sector was not involved, for example, in providing housing. We conclude that well-established cross-sectoral collaboration and long-term resources are needed for a municipality to bend fate in its favor (Dahl et al., 2010).

What Is at Stake?

Increasing resource extraction, infrastructure development, and other human disturbances pose serious challenges for reindeer herding today, especially in Arctic Fennoscandia, where fragmentation and cumulative loss of reindeer pasture are very high (Rosqvist et al., 2020). Challenges for reindeer herding were already discussed in the Arctic Council report "Sustainable Reindeer Husbandry" (Jernsletten &

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Klokov, 2002), where loss of pastures was posed as one of the most serious threats. Strangely, the accumulation of such impacts is still not acknowledged in land use planning. Also, sadly there is no formal recipient of community-led assessments of impacts on reindeer herding even if those provide a more informed perspective of negative social consequences on Sámi culture. Instead, our examples reveal significant negative consequences for local communities because corporations act out of self-interest and therefore may downplay the full impacts, especially if these venture into the project (Blowfield, 2005).

As pointed out in the Arctic Climate Impact Assessment (ACIA, 2004), the effect of global warming “could have” a large impact on reindeer husbandry. We do note that climate warming has already had a significant impact on reindeer, especially during winter, adding to the already high pressure from human disturbances (e.g., Rosqvist, Inga, & Eriksson, 2022; Rasmus et al., 2022). Still, impacts from climate change are not yet incorporated in IA in any satisfactory manner (Rosqvist et al., 2020; Nilsson, Avango, & Rosqvist, 2021), and therefore the vulnerability of the ecosystem used by reindeer is greatly underestimated.

The need for a special social impact management plan for mining in Sodankylä reflects the poor performance of the state of the art single project impact assessments. They lack a proper evaluation of impacts on humans and their socio-cultural-economic surrounding. It was disappointing that the positive local outcomes promised by the original separate impact assessments could not be fulfilled because of the lack of resources for, in particular, new housing and infrastructure. Instead of wishful predictions, the assessment procedure of social impacts needs more emphasis on follow-up studies of impacts of previous and ongoing mining activities. This would also increase local acceptance of mining and provide social license to operate, which is often emphasized by the mining industry (cf. Heikkinen et al., 2016). For example, some 80 percent of respondents in Sodankylä municipality answered that mining is locally accepted in three different surveys (Kuisma & Suopajärvi, 2017; Saariniemi, 2018). However, when looking at the open-ended answers, there were many reservations, such as “if environmental issues are taken care of” and “if the mine will bring benefits or jobs for the locality” (Tulilehto & Suopajärvi, 2021). If we take this kind of local reservation to mining seriously, it is evident that the emphasis of assessing social and environmental impacts should be more on following up the real impacts than on predicting only potential ones. Transparent follow-up studies could also be seen as an investment for a sustainably prospering mining industry. There is a dire need for strategic decisions about environmental and social development in Arctic Fennoscandia. Demand is now increasing rapidly for further extraction of minerals/metals and for production of renewable energy driven by the “green” transition.

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It is clearly demonstrated that analysis of societal consequences needs to be included in assessments of impacts in the Arctic if the aim is to plan for long-term sustainability (Carson & Peterson, 2016; Wormbs and Sörlin, 2017). Nonetheless, governing authorities continue to react to development proposals rather than proactively anticipating them. EIAs are carried out too late, when strategic decisions have already been made or when there is a lack of strategic planning. Hence, only a limited range of feasible alternatives is addressed. The relative importance of a proposed project on the economy of a small municipality may be too large for considerations of alternatives, so regional planning is needed. The fact that the EIA process is corporate led means that the results most often serve the purpose of justifying and legitimizing proposed extraction or other activities. Participation in the EIA process may therefore become a moral dilemma for stakeholders who don't accept or consider the project as legitimate to start with. Such are, for example, reindeer herding communities that wish for an alternative option to be assessed than the ones that are tied to certain development projects under compulsory EIA procedures. Still, SRCs must participate in consultations to voice their opinions on pre-set options introduced by the developer for their planning purposes. This task has become overwhelming for many communities due to the large number of consultations of land use changing projects: To such an extent that they argue, for example, that they have to choose "whether they should conduct reindeer herding or go to planning meetings" (Österlin & Raitio, 2020). It is obvious that cumulative environmental and social impacts should be assessed and evaluated in the early stages of decision-making if the aim of the procedure is to meet environmental and social development goals (Fischer & Gonzales, 2015; Nilsson et al., 2021). In Fennoscandia there is a long tradition of multiple-level land use planning. Particularly, large-scale land use planning instruments, such as the "Comprehensive plans" in Sweden and "the Government decision on Finland's national land use guidelines", should be better equipped to handle multiple and temporally cumulative pressures on environment and people. They should also steer more actively on the regional and local level. As our cases show, the current systems are lacking, and environmental governance is more reactive than proactive. One development path might be enhancing the implementation of Strategic Environmental Assessment (SEA) (Noble & Nwanekezie, 2017), introduced by the European Commission for spatial planning. The use of SEA within the EU is regulated through the directive on the assessment of the effects of certain plans and programs on the environment (EU Directive 2001/42/EC), but SEAs are still poorly utilized, as they are not yet mandatory (Wretling et al., 2021). SEAs might be used to ensure that environmental and social issues are considered early, and crosscutting sectors and alternative future pathways would be explored before the planning of a certain project begins.

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Thus, we conclude that in the light of our case studies the impact assessments should be deconstructed and reworked at every level of land use administration. Rethinking should start from national level land use planning instruments and proceed to practical EIA procedures with their pre-set development driving options and limited temporal and spatial scope. This notion will become even more urgent and topical when climate change adds a new layer of accumulating but hardly fully predictable impacts and threats.

It is true that many Arctic societies have shown proof of high resilience as they have adapted earlier to changing conditions. However, multiple pressures from long-term resource exploitation and effects from rapid climate change now risk pushing reindeer herding communities to their brink. Our example from Sodankylä municipality shows that planning for a sustainable future becomes an overwhelming challenge when there are not enough material and human resources allocated to adapt to the rapidly changing conditions resulting from extractivism.

Note

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References

ACIA (2004). *Impacts of a Warming Arctic: Arctic Climate Impact Assessment. ACIA Overview Report*. Cambridge: Cambridge University Press.

Atlin, C. and Gibson, R. (2017). Lasting regional gains from non-renewable resource extraction: The role of sustainability-based cumulative effects assessment and regional planning for mining development in Canada. *Extractive Industries and Society*, 4(1), 36–52. https://doi.org/10.1016/j.exis.2017.01.005

Avango, D., Lépy, É., Brännström, M., Heikkinen, H. I., Komu, T., Pashkevich, A., and Österlin, C. (2023). Heritage for the future: Narrating abandoned mining sites. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Blowfield, M. (2005). Corporate Social Responsibility: reinventing the meaning of development? *International Affairs*, 81, 515–524. https://doi.org/10.1111/j.1468-2346.2005.00466.x

Carson, M. and Peterson, G. (eds.). (2016). *Arctic Resilience Report*. Stockholm: Arctic Council, Stockholm Environment Institute and Stockholm Resilience Centre.

Dahl, J., Fondahl, G., Petrov, A., and Fjellheim, R. S. (2010). Fate control. In J. Nymand Larsen, G. Fondahl, and P. Schweitzer, eds., *Arctic Social Indicators: A Follow-up to the Arctic Human Development Report*. *TemaNord* 2010: 519. Copenhagen: Nordic Council of Ministers. pp. 129–146.

Donner-Amnell, J. (1991). Metsäteollisuus yhteiskunnallisena kysymyksenä Suomessa. In I. Massa, and R. Sairinen, eds., *Ympäristökysymys. Helsinki: Gaudeamus*, pp. 265–306.

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Duinker, P. N., Burbidge, E. L., Boardley, S. R., and Greig, L. A. (2013). Scientific dimensions of cumulative effects assessment: Toward improvements in guidance for practice. *Environmental Reviews*, 21(1), 40–52. https://doi.org/10.1139/er-2012-0035

EIA Law (252/2017) and Decree (2017/277) in Finland, www.finlex.fi/fi/laki/ajantasa/2017/20170252

Fischer, T. and González, A. (2015). Introduction. In B. Sadler, J. Dusik, T. Fischer, M. Partidario, R. Verheem, and R. Aschemann, eds., *Handbook of Strategic Environmental Assessment*. London: Routledge, pp. 2–10.

Fohringer, C., Rosqvist, G., Inga, N., and Singh, N. J. (2021). Reindeer husbandry in peril? How extractive industries exert multiple pressures on an Arctic pastoral ecosystem. *People and Nature*, 3, 872–886. https://doi.org/10.1002/pan3.10234

Franks, D. M. and Vanclay, F. (2013). Social impact management plans: Innovation in corporate and public policy. *Environmental Impact Assessment Review*, 43, 40–48.

Franks, D. M., Brereton, D., Moran, C., Sarker, T., and Cohen, T. (2010). *Cumulative Impacts: A Good Practice Guide for the Australian Coal Mining Industry*. Brisbane: Centre for Social Responsibility in Mining & Centre for Water in the Minerals Industry, Sustainable Minerals Institute, the University of Queensland. www.csrm.uq.edu.au/publications/cumulative-impacts-guide

Glasson, J. and Therivel, R. (2019). *Introduction to Environmental Impact Assessment*. London: Routledge.

Heikkinen, H. I., Lépy, É., Sarkki, S., and Komu, T. (2016). Challenges in acquiring a social licence to mine in the globalising Arctic. *Polar Record*, 52(4), 399–411.

Hietala, A-H., Syväjärvi, V., and Mauno, P. (2015). Kevitsan kohtalo huolettaa Sodankylässä – emoyhtiö myy kaivoksia, Kevitsa yksi vaihtoehto. Lapin Kansa online article. www.lapinkansa.fi/kevitsan-kohtalo-huolettaa-sodankylassa-emoyhtio-m/2962.

Horstkotte, T., Lépy, É., Risvoll, C. et al. (2020). *Supplementary Feeding in Reindeer Husbandry: Results from a Workshop with Reindeer Herders and Researchers form Norway, Sweden and Finland*. Umeå: Umeå University. www.umu.se/globalassets/organisation/utan-fakultetstillhorighet/arktiskt-centrum-vid-umea-universitet/arctic-publications/supplementary-feeding-report_eng.pdf

IAIA, International Association of Impact Assessment. Website. www.iaia.org/

Jernsletten, J-L. and Klokov, K. (2002). *Sustainable Reindeer Husbandry*. Tromsø: Centre for Saami Studies.

Kantola, A. (2016). *Base-Line Study of Sodankylä*. Regina-project. Unpublished report.

Kokko, K., Oksanen, A., Hast, S., Heikkinen, H. I., Hentilä, H-L., Jokinen, M., Komu, T., Kunnari, M., Lépy, É., Soudunsaari, L., Suikkanen, A., and Suopajärvi, L. (2014). *Sound Mining in the North: A Guide to Environmental Regulation and Best Practices Supporting Social Sustainability*. Rovaniemi: University of Lapland. https://lauda.ulapland.fi/handle/10024/59503

Kuisma, M. and Suopajärvi, L. (2017). *Social Impacts of Mining in Sodankylä. REGINA-Project*. Rovaniemi: University of Lapland.

Larsen, R. K. (2018). Impact assessment and indigenous self determination: A scalar framework of participation options. *Impact Assessment and Project Appraisal*, 36 (3), 208–219. doi: 10.1080/14615517.2017.1390874

Lawrence, R. and Larsen, R. K. (2016). *"Då är det inte renskötsel" - Konsekvenser av en gruvetablering i Laver, Älvsbyn, för Semisjaur Njarg sameby*. Stockholm: Stockholm Environment Institute.

Lawrence, R. and Larsen, R. K. (2017). The politics of planning: Assessing the impacts of mining on Sami lands. *Third World Quarterly*, 38(5), 1164–1180. https://doi.org/10.1080/01436597.2016.1257909

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Lindeström, L. and Eriksson, N. (2014). *Laver-Ansökan om bearbetningskoncession*. Miljökonsekvensbeskrivning. Boliden Mineral AB.

LKAB, Laevas- & Gabna samebyar. (2015). Cumulative consequences for reindeer herding. *Online handbook*. www.lkab.com/sv/SysSiteAssets/documents/blandat/metodhandbok_kumulativa-konsekvenser-for-rennaringen.pdf

Lockie, S., Franettovich, M., Petkova Timmer, V., Rolfe, J., and Ivanova, G. (2009). Coal mining and the resource community cycle: A longitudinal assessment of the social impacts of the Coppabella coal mine. *Environmental Impact Assessment Review*, 29, 330–339. https://doi.org/10.1016/j.eiar.2009.01.008

Lovisagruvan. (2021). Samrådsunderlag- inför ansökan om bearbetningskoncession Pahtohavare K/Nr 1. Online report. https://mb.cision.com/Main/11567/3346058/1416796.pdf

Metsähallitus. (2018). Metsähallitus Parks & Wildlife in Lapland. Online brochure. https://julkaisut.metsa.fi/assets/pdf/lp/Esitteet/Parks-et-Wildlife-Finland-Lapland.pdf

Ministry of the Environment of Finland. (2021). Land use planning. Website. https://ym.fi/en/land-use-planning

Nilsson, A. E., Avango, D., and Rosqvist, G. (2021). Social-Ecological-technological systems consequences of mining: An analytical framework for more holistic impact assessments. *Extractive Industries and Society*. https://doi.org/10.1016/j.exis.2021.101011

Nilsson, R. and Blom A. (2018). Fördjupad konsekvensanalys över påverkan på rennäringen av LKAB:a gruvverksamhet i Kiruna. Online report. https://njalla.com/wp-content/uploads/2021/02/konsekvensanalys-kiruna.pdf

Nilsson, R., Blom, A., Sandström, P., and Sandström, S. Laevas sameby. (2014). Rennäringsanalys Leveäniemi. Gruvverksamhetens konsekvenser för Laevas och Gabna samebyar.

Noble, B. and Nwanekezie, K. (2017). Conceptualizing strategic environmental assessment: Principles, approaches and research directions. *Environmental Impact Assessment Review*, 62, 165–173. https://doi.org/10.1016/j.eiar.2016.03.005

Nordregio, (2015). REGINA – Regional Innovation in the Nordic Arctic and Scotland with a special focus on regions with large-scale projects. Website. https://nordregio.org/research/regina/

Olofsson, T. (2020). *Mining Futures: Predictions and Uncertainty in Swedish Mineral Exploration*. Uppsala: Uppsala University.

Österlin, C. and Raitio, K. (2020). Fragmented landscapes and planscapes: The double pressure of increasing natural resource exploitation on Indigenous Sámi lands in northern Sweden. *Resources*, 9(104), 104. https://doi.org/10.3390/resources9090104

Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Raitio, K., Allard, C., and Lawrence, R. (2020). Mineral extraction in Swedish Sápmi: The regulatory gap between Sámi rights and Sweden's mining permitting practices. *Land Use Policy*, 99(105001). https://doi.org/https://doi.org/10.1016/j.landusepol.2020.105001

Ramboll. (2020). Sakatin aluetalousvaikutukset paikallisesti, alueellisesti ja kansallisesti. file:///C:/Users/k%C3%A4ytt%C3%A4j%C3%A4/Downloads/LAPPI_Liite%2021%20Aluetalousvaikutukset%20(1).pdf

Rannikko, P. (2010). Luonnonkäytön muutos paikallisena legitimiteettihaasteena. In P. Rannikko and T. Määttä. eds., *Luonnonvarojen hallinnan legitimiteetti*. Tampere: Vastapaino, pp. 257–294.

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Rasmus, S., Horstkotte, T., Turunen, M., Landauer, M., Löf, A., Lehtonen, I., Rosqvist, G., and Holand, Ø. (2022). Reindeer husbandry and climate change: Challenges for adaptation. In T. Horstkotte, Ø. Holand, J. Kumpula, and J. Moen, eds., *Reindeer Husbandry and Global Environmental Change: Pastoralism in Fennoscandia*. London: Routledge. pp. 99–117.

Rosqvist, G., Inga, N., and Eriksson, P. (2022) Impacts of climate warming on reindeer husbandry require new land use strategies. *Ambio*, 51, 1247–1262. https://doi.org/10.1007/s13280–021-01655-2

Rosqvist, G., Österlin, C., Fohringer, C., Eriksson, P., Fischer, S., and Avango, D. (2020). Accelerating climate and land-use pressure on environment and people in Arctic Sweden: Challenges for sustainable land use planning. In Österlin, C. *Nature Conservation, Landscape Change and Indigenous Rights*. Doctoral dissertation, Department of Physical Geography, Stockholm University.

Rupert Resources. (2021). Pahtavaaran kaivos. Website. https://rupertresources.com/fi/pahtavaara-mine/

Saariniemi, J. (2018). *Experienced Impacts of Mining in Sodankylä: Follow-up Study*. Rovaniemi: University of Lapland.

Sarala, P. (2010). Lappi – malmien ja mineraalien maa. In P. Sarala, ed., *Lapin geologiset luonnonvarat*. Rovaniemi: Lapin tutkimusseura, pp. 69–71.

Skarin, A. and Åhman, B. (2014). Do human activity and infrastructure disturb domesticated reindeer? The need for the reindeer's perspective. *Polar Biology*, 37(7), 1041–1054. https://doi.org/10.1007/s00300–014-1499-5

Sodankylä Municipality. (2018). Sodankylä Municipality's Mining Programme 2018–2021. Online brochure. www.kaivos.fi/wp-content/uploads/2020/03/Sodankyl%C3%A4n_kaivosohjelma_EN_v12_WEB.pdf

Sörlin, S. (2023). The extractivist paradigm: Arctic resources and the planetary mine. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Suopajärvi, L. (2013). Social impact assessment in mining projects in Northern Finland: Comparing practice to theory. *Environmental Impact Assessment Review*, 42, 25–30. https://doi.org/10.1016/j.eiar.2013.04.003

Suopajärvi, L. and Kantola, A. (2020). Social impact management plan as a tool for local planning. Case study: Mining in Northern Finland. *Land Use Policy*, 93, 104046. https://doi.org/10.1016/j.landusepol.2019.104046

Tryland, M., Nymo, I. H., Romano, J. S., Mørk, T., Klein, J., and Rockström, U. (2019). Infectious disease outbreak associated with supplementary feeding of semi-domesticated reindeer. *Frontiers in Veterinary Science*, 6, 126. https://doi.org/10.3389/fvets.2019.00126

Tulilehto, M. and Suopajärvi, L. (2021). *Experienced Impacts of Mining in Sodankylä: Follow-up Study*. Rovaniemi: University of Lapland.

Vanclay, F. (2002). Conceptualising social impacts. *Environmental Impact Assessment Review*, 22(3), 183–221. https://doi.org./10.1016/S0195–9255(01)00105-6

Vanclay, F. (2003). International principles for social impact assessment. *Impact Assessment and Project Appraisal*, 21(1), 5–11. https://doi.org/10.3152/147154603781766491

Vanclay, F. and Esteves, A. M. (2011). Current issues and trends in social impact assessments. In F. Vanclay and A. M. Esteves, eds., *New Directions in Social Impact Assessments. Conceptual and Methodological Advances*. Cheltenham: Edward Elgar, pp. 3–19.

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Vanclay, F., Esteves, A. M., Aucamp, I., and Franks, D. M. (2015). *Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects*. Fargo, ND: International Association for Impact Assessment.

Wormbs, N. and Sörlin, S. (2017). Arctic futures: Agency and assessing assessments. In L-A. Körber, S. MacKenzie, and A. Westerståhl Stenport, eds., *Arctic Environmental Modernities from the Age of Polar Exploration to the Era of the Anthropocene*. London: Palgrave Macmillan, pp. 263–285.

Wretling, V., Hörnberg, C., Gunnarsson-Östling, U., and Balfors, B. (2021). SEA screening practice and the inclusion of environmental objectives in Swedish energy and climate planning. *Impact Assessment and Project Appraisal*, 39(2), 151–166, https://doi.org/10.1080/14615517.2021.1893929

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III

Affect

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7

Affective Approaches

Rethinking Emotions in Resource Extraction

LILL RASTAD BJØRST, FRANK SEJERSEN, KIRSTEN THISTED

What Counts as Facts?

> so there is a factual story about a project that has huge potential and can be developed without having major impacts and to bring about many benefits to Greenland's society. Then there are rumors, there are myths that are designed to cause people to be scared and concerned and they are two different things. We want to continue to be able to educate people so that they can be able to understand the project in a factual sense and not in a sense that is removed from science and the facts
>
> *(Mair, Narsaq 2021).*[1]

With these words John Mair, CEO of Greenland Minerals, at the hearing on the Kuannersuit project in South Greenland, Narsaq on 9 February 2021, answered a question about whether the town of Narsaq will end up having to be evacuated if the mine is launched. The questioner found that two very different stories about the mining project were dividing the population: a story where uranium plays a big role and where there is talk of the town being evacuated, and another story where uranium plays no role, and the mine will have no environmental consequences. In other words, the questioner from Narsaq wanted to know which story to believe. To the citizens of Narsaq the two storylines about saving or destroying the local community were conflicting (Bjørst, 2017). In Mair's response, one of these narratives was equated with rumors, myths, scare campaigns, and non-factual information (see quote), the other with scientific facts. The part of the population that believed in rumors needed to be educated – a task that the CEO argued the company had taken on. Thus, Mair constructed and mobilized an opposition that worked as an organizing mechanism for producing, categorizing, and understanding voices.

Mair himself was clearly affected by emotion when he made the above statement at the end of a two-and-a-half-hour-long consultation meeting. It was not the first time he answered these kinds of questions. Since the beginning of the

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project development, the coexistence with the active open-pit mine has been questioned by some of the local citizens (Bjørst, 2016; Hansen & Johnstone, 2019). At this point during the event, Mair was tired and clearly annoyed. The time difference to Australia also had to be taken into consideration (he participated via an online Zoom call). Even on a deeper level, however, Mair's own argumentation was marked by emotion. By equating the mining project with "potentials" and "benefits" to the Greenlandic society, Mair evoked hope and optimism for future happiness, both for the individual and for society as a whole. It was indeed a prosperous future that the Greenlanders would block if they opposed the mining project. Yet, he took the right to define emotion as something that was neither associated with him nor the narrative he represented but only the party opposing the mining project.

The opposition between facts/support of mining versus emotions/resistance to mining is a firmly established rhetorical figure in conflicts concerning extractive industries (Sejersen & Thisted, 2021). In the hegemonic discourse on mining and extraction, financial gain is equated with facts, while taking into account "softer" values such as well-being and ecology equates to "emotion." Inherited from a centuries-long European discourse on enlightenment, there is a consensus that reason ranks above emotion. To a wide extent, social scientists (e.g., Febvre, 1941; Durkheim, 2008 [1912]; Elias, 2010 [1939]) have promoted a perspective on emotion as a kind of instinct that at all times threatens to overwhelm man and take power over intellect and reason. Society and socialization must therefore undertake to tame impulses and desire, with the intention of curbing barbarism and ensuring enlightenment and progress (Vallgårda, 2013). Thus, there is a vast discursive power associated with the right to judge what can count as reason and what must be dismissed as emotion. Therefore, an essential part of getting control is to gain the power to define *what counts* as facts. To get the facts *right* is only the next step. An obvious topic for a humanities-based approach to mining and extraction is to take a closer look at such speaking positions. In previous work, we have argued that instead of accepting the prevailing discourse that emotions should be seen as irrelevant to the issue of extraction, we must analyze how emotions are included in the debate and with what effect (Bjørst, 2020; Thisted, 2020; Sejersen & Thisted, 2021; Thisted, Sejersen, & Lien, 2021). Hence, we ask: What is the significance of the affective, which is usually excluded from the analysis of mining?

This chapter focuses on the consultation processes in Narsaq, South West Greenland in connection with Greenland Minerals' mining project in Kuannersuit, located approximately seven kilometers away from the town. According to the Mineral Resources Act (Naalakkersuisut, 2009), the consultation meetings are mandatory when the environmental impact assessment (EIA) and the social sustainability assessment (SSA) are made available for public consultation.

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The Act states in §87c that: “[d]uring the consultation period, the Government of Greenland must conduct public consultation meetings in towns and villages particularly affected by the activities” (Naalakkersuisut 2009; 34). Apart from this, the Mineral Resources Act does not give a lot of information about the format of the meetings. Minutes must be taken, and on the Government of Greenland web page it is promised that all questions, answers, and comments will be included in the White Paper and thereby form part of the basis for the Government’s decision. If a company wants to pursue mining in Greenland the process of engagement appears quite transparent, straightforward, and with appropriate time and space allowed for legitimate voices (Sejersen, 2018). Hence, as an inherent component of the mining project apparatus, the public hearing in Narsaq had to take place.

The hearing was one step in a long chain of sequential procedures driving the project forward. The hearing process was choreographed as questions and answers, where persons “outside” the project (like NGOs, local people, stakeholders etc.) could ask questions to institutions “inside” the project (like the company, authorities, experts etc.). This hearing choreography is not universal, and in the Arctic many models have been pursued (Arctic EIA project, 2019) when industrial development was on the drawing table. Since 2010, there have been several public consultation and hearing processes related to potential mining projects in Greenland. According to Ackrén (2016), public consultation processes or hearing processes in relation to mining industry projects can be characterized as deliberative democracy processes. However, during and after the public hearings, locals often expressed their frustration over a lack of meaningful involvement, and researchers in the field have criticized the process as well (Nuttall, 2012a, b; Sejersen, 2015). Critics have been pointing out the problems with one-way communication, the dominance of one knowledge regime, technical concepts and figures, as well as information not related to everyday life in Greenland.

The Emotional Approach: A Review

Greenland extractivism has constantly been promoted as a pathway to welfare (Hastrup & Lien, 2020; Sejersen, 2020), and many assessments and consultations have been pursued. Public consultation processes in Greenland have been analyzed and described, for example, from the perspective of social science (Aaen, 2012; Hansen, 2014; Sejersen, 2015; Ackrén, 2016; Heinämäki, 2020; Johnson, 2020; Nuttall, 2013, 2015), law (Basse, 2014), and planning and engineering (Hansen & Kørnøv, 2010; Olsen & Hansen, 2014; Hansen & Johnson 2019). Many of these studies are structured around the question of how local involvement can be pursued in proper and meaningful ways. The critical approach pursued by the authors directly or indirectly lean on normative ideas of what constitutes proper or

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adequate involvement. Aaen (2012), for example, uses Habermas' ideas about democratic legitimacy, while Basse (2014) applies ideas agreed in the Aarhus convention. Merrild Hansen (Hansen, 2010; Hansen & Kornøv, 2010; Hansen & Johnstone, 2019) has pointed at how hearing phases and procedures could be optimized and elaborated in order to improve the integration of local voices. In a historical analysis Klaus G. Hansen (2014) applies three levels of legitimacy (formal, factual, and public), and concludes that a growing formal political influence in a postcolonial context might create space for an increasing number of voices and a diversity of positions in public debates and in decision-making-processes.

The requirement for more disclosure, openness, and transparency is, however, still an issue. Dodds and Nuttall (2016) criticize how contemporary local experiences and knowledge are erased, silenced, forgotten, or downplayed when mining projects are pursued, due to the fact that the production of technical knowledge becomes so dominant and is taking place in a state formation process, which deterritorializes space. In a similar way, Sejersen (2015) argues that the circulation of data and perspectives on mega projects is embedded in an empire of expertise, which in itself makes it difficult to have many voices present at the same time. Sejersen (2015, 2018) proposes that this particular knowledge regime not only marginalizes some voices but also disciplines the remaining voices in order to make them fit the process.

This body of studies clearly shows that there is a critical focus on how public hearings could be organized in a better way. Our intention in bringing in the theoretical perspective of affect is to supplement these studies with a focus on some of the micro dynamics, where language, time, narrative, and atmosphere play a role. We point at how affect plays a role in setting the stage and how people are making sense of what is going on. The "affective turn"[2] in cultural and social sciences (c.f. Clough, 2008; Greco & Stenner, 2008) has had a growing influence, not least because it bridges the social and the biological, which have conventionally been treated as separate analytical objects. Thus, affect theory has brought the body back into the political arena, also in its own right and not just as a background for studies of (mis)representation (Thrift, 2007; Wetherell, 2012).

Rather than regarding emotions as individual psychological states, social sciences view emotion as social practice, located in interaction. Drawing on Pierre Bourdieu's concept *habitus*, the historian Barbara Rosenwein (2006:15) coined the concept *emotional communities* in order to explain how emotions are never "pure" or unmediated, but products of experience, shaped by the person's household, neighborhood, and larger society. Communities are not only based on shared repertoires of interpretation or discourses, as Michel Foucault showed, but also on shared repertoires of emotional practices, which like discourses have a disciplining

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function (Rosenwein, 2006: 25). Like Rosenwein, the social psychologist Margaret Wetherell (2012: 52) refrains from specifying the exact relation between emotions and discourses but prefers to see them as interwoven in what she describes as *affective meaning-making*: "affective assemblages operating in important scenes in everyday life along with their social consequences and entitlements." Hence, it is through such *affective practices* that norms, values, discourses etc. become embedded in the individual as a "potential" (Wetherell, 2012: 22). Wetherell rejects the idea, put forward by many scholars, that discourse should have a taming effect on affect. Rather, discourse makes affect powerful and provides the means for affect to travel and spread from one person to another (Wetherell, 2012: 19). Following Wetherell, the CEO John Mair's response cited at the beginning of this chapter can be seen as such an assemblage of discourse and affect.

A situation like this has the character of a practice: a *speech act* (Austin, 1975 [1962]) with the purpose of closing the discussion or keeping it from being understood as political. In her studies of the Greenland mining sector, Bjørst (2020), for example, introduces a critical approach toward emotions presented as flirtation around "partnerships" as they play out in the mining sector. She argues that "the political seduction involved works best when it pretends to turn away from the political and focus on future relationships" (Bjørst, 2020: 5). We will be looking further into this "anti-politics machine" later in the chapter (see section "Disciplining of Voices"). First, we will analyze how this distinction between facts and emotions gives power to one set of emotions but suppresses another. It will be demonstrated how the hearing can be seen as a form of *apparatus* in which atmosphere and emotions are orchestrated, allowing some emotional practices, while excluding other practices. The concept of atmosphere has become prominent, to the point where Bille and Simonsen (2021) argue that – in order to emphasize the spatial and material aspects of affect – "literature within geography has turned from affect to affective atmospheres." Bille and Simonsen introduce the concept of "atmospheric practices," and we will argue that the orchestrating of atmosphere of the hearing can be seen as such practice. Since human beings are not, as Bille and Simonsen (2021: 299) point out, "affective dopes," but "practitioners of emotions," an atmosphere is always open, unfinished. The organizers may control the apparatus of the hearing, and they can try to tune the atmosphere through a row of atmospheric practices but in the end, as we shall see, they cannot determine the atmosphere.

Working a Translocal Fieldwork Site

The study's empirical focus is primarily the public hearing event in Narsaq, in February 2021. In event ethnography, meetings are not isolated events but part of an *apparatus* (further on this concept later) that could make mining possible.

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Studying mining takes the researchers to fora and unexpected networks both in and outside local communities. Campbell et al. (2014), who have studied global environmental meetings, describe meetings as an active political space and the atmosphere, scenery, and format of these meetings can influence the understanding of what happens and with what effect (Brosius & Campbell, 2010).

The hearing in Narsaq stands out as an important event in the process of public consultation. It was followed by people situated in a number of countries. Because of the corona pandemic, only one hundred participants were allowed in the room. The event was broadcast to all of Greenland, and it was also possible to follow the event online (but with a somewhat problematic access to translation). Our study is thus based on online translocal observations (Rokka, 2010) where our focus was on the broadcasted event itself and the digital traffic it created, mostly on Facebook, which is the most used online platform in Greenland. We have identified the hearing in Narsaq as an important communicative event, since this hearing represents a culmination of the public dispute about the Kuannersuit project (also known as the Kvanefjeld project, named after the mountain). Suddenly, a lot was at stake as a parliamentary election was announced the day before the hearing. It was not only the future of Narsaq that was debated – but the future of all of Greenland and government principles. The many contrasting voices from when Greenland lifted the uranium ban in 2013 until this day were part of the conversation (directly and indirectly). Two different futures were present at the hearing: It was either a future with *or* without mining in Narsaq.

Narsaq, 9 February 2021: Public Consultation Meeting regarding the Kuannersuit Project

During the hearing, one participant suddenly aired a strong frustration over the answers that were given by the company, experts, and the authorities:

> During the public meetings in Narsarsuaq, Qaqortoq and this evening in Narsaq, citizens raise their concerns about the EIAs and the answers have been that there is nothing to worry about. If it is impossible for you to be more specific about the environmental impacts that is a source of concern for the citizens, I sense that some feel or respond to me that they are questioning the credibility of the assessments. How come that no one addresses the concerns on the basis of the potential impacts.[3]

The statement resulted in applause from the audience. From the speaker's point of view the procedures do not carry the legitimacy that they are claimed to have. Trust in the system is not obvious, and the person pointed to the inherent problem of the particular system: It does not have the community as its central focus but rather the mining project.

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Recurrently, the questions showed distrust: Have they monitored everything in detail? The distrust is glued to two different understandings of research: one that sees research as *inadequate* because it does not understand the locality in detail, and a second that sees research as based on *reductionism* because it deals with "reality" as if it were a laboratorium, where elements (like the wind) can be turned into a solid factor, that is fed into a scientific system of developed causalities. One participant among the audience glued mistrust to the company itself, by putting focus on the intentions of the company: "I know you are only here because of the money . . . Do you plan to make the community pay or do you intend to leave our country quietly?" Again, the audience applauded. By bringing the motif of the company into the conversation, the person also addressed a particular understanding of the moral economy of the mining project.

This strategy of dismantling trust touched the fundamental understanding of the company as having mutual interests with the community. Furthermore, it produced affects linked to concern and anti-sociality. The company's positive arguments about the mine's contribution to the economy of Greenland as well as the global green transition were put in a shadow. All the good that the company wanted the mine to signal was challenged by part of the audience. One opponent to the mine argued that control of the mining activities had to be pursued by Greenlanders. Another participant was worried for her health: "Can you guarantee me that my health will not be affected? Yes or No?" The answer from the expert was a "yes" if the data and the models were correct and if proper control was implemented. To this response the citizen replied that "one feels that if one asks direct questions then the answers are always very vague. I do not feel comfortable, the project makes me worried. Therefore, I have to ask if I will be affected." Applause from the audience.

Kell Svenningsen from the authorities guaranteed that the project would be stopped if the limits were crossed. The concern about health was underlined by another participant who borrowed examples from negative mining experiences in other parts of the world. The audience applauded. By situating the future Narsaq mine in a global space of existing mines this person opened up a possibility to destabilize the apparatus that isolated and contained the local project and protected it from comparative global perspectives (Sejersen, 2015).

Organizing Affective Life at a Citizens' Meeting

The meeting was held in the Narsaq assembly hall. The setting of the meeting was handled by a moderator appointed by the Government of Greenland, in line with the Minerals Act. Present were also interpreters, TV journalists (KNR), and – due to a bomb threat – uniformed police (Brøns, 2021). The framework was thus embedded in the debate culture that forms the basis of liberal democracy, where a

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precondition is that everyone can speak, and all voices can be heard. Public hearings on such projects, which can be expected to intervene decisively in citizens' future everyday lives, are, however, a special genre within liberal democracy, not least because they are most often arranged by the project company (Hansen, 2014).

Public hearings may be events in a long chain of formal engagements of different characters and formats. In Foucault's terminology, such an institution, embedded in a network of discourses, actors, genres etc. is called an *apparatus* (in French: *dispositif*). An apparatus may configure how temporality, space, agency, knowledge, and context are to be approached and performed. Hence the apparatus has a disciplinary impact on epistemology and ontology. Foucault characterizes "apparatus" as always being inscribed in a game of power and certain knowledge coordinates. Homi Bhabha (1994: 70) talks about the various colonial discourses as an "apparatus of power." Apparatus, however, should not be understood as a passive instrument of observation but rather as material-discursive practices that produce differences and demarcations and hence phenomena (Højgaard & Søndergaard, 2010: 323). Through these practices an apparatus can constitute specific *intra-actions*, which results in agential cuts (Barad, 2007: 155; Bjørst, 2011: 72). In other words, agency is part of an interaction and an enactment – not only something you *have* or *do* (Barad, 2007: 214). Karen Barad writes the following about agency: "Agency never ends; it can never 'run out'. The notion of intra-actions reformulates the traditional notions of causality and agency in an ongoing reconfiguring of both the real and the possible" (Barad, 2007: 177). The apparatus influences what is legitimized as the right kind of knowledge about mining in Greenland.

According to cultural-political geographer Ben Anderson (2016) the organization and mediation of affects is part and parcel of any such apparatus. Atmospheres are "spaces 'tinted' by the presence of objects, humans or environmental constellations . . . They are spheres of a presence of something, of its reality in space" (Böhme, 1995: 33, quoted from Anderson, 2016: 151). Due to their intangibility, atmospheres always remain open and ambiguous (Anderson, 2016: 156), always in the process of emerging and transforming (Anderson, 2016: 145). The organizers of a meeting may try to "tune" the space and control the atmosphere, but this does not ultimately predict or determine the outcome, since an atmosphere is always translated into individual experience through encounters (Anderson, 2016). This becomes extremely visible in this case, where the meeting was carefully staged in order to tune and maintain an atmosphere of peace and order, good governance, trust, and security, yet it ended up in anger, frustration, noise, and miscommunication.

First and foremost, the Narsaq hearing was framed by the prepared agenda, which appeared on one of the first slides in a power point presentation. The agenda

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was presented as the first item by the moderator. The moderator also instructed the audience in detail on how to behave during the meeting, in particular as to when to ask questions (after the three speakers had delivered their presentations), how to ask questions (which had to be asked in advance, during the break), how many questions to ask (only two each), and within which areas to ask questions (it was okay to address issues related to environment, society, and health but not to issues related to politics, husbandry, and fauna. It was, however, emphasized that all questions were welcomed if they were put in writing on a particular website). Thus, the moderator not only handled the meeting but also played an important role in the orchestration of feeling and atmosphere. With body language, facial expressions, and voice, he exuded calmness and control.

The fact that the entire first half of the meeting was occupied by three long informative speeches was the most crucial step in terms of orchestrating the atmosphere of the meeting. First, Jørgen T. Hammeken-Holm from the Ministry of Mineral Resources presented how the whole mining assessment and consultation process is divided into phases with fixed rules for pretty much everything in each phase. Next, Johannes Kyed from Greenland Minerals reviewed how the project will contribute to solving Greenland's economic problems, while at the same time being a huge help to the global climate as the transition to electricity will reduce CO_2 emissions. According to Kyed, problems regarding the mine, such as dust problems, disposal of waste (tailings) etc. have been thoroughly investigated – and solved. All calculations showed that there will be no risks for public health or the environment. Thus, Kyed created a chain of equivalence among the Kuannersuit project, economic opportunities, education and jobs, economic independence, and global green transition. Failure to start the project would consequently result in the absence of all these promising possibilities and lead to the situation described as "Dødens gab" (Death's gap), indicating the gap between expected revenues and expenditures in the state budget (Rosing, 2014). The question in this study is not whether this is true or false, but how such statements frame and produce emotions and voices. Both statements glue good emotions to the mine by upscaling the effects of Kuannersuit. Consequently, a person's critique of the mine makes the person a killjoy that is unable to see the benefits to the common good, locally, nationally, and globally (Thisted, 2020).

In fact, the third speaker, Christian Juncker Jørgensen from the Danish Centre for Environment and Energy, expressed several reservations, as the EIA-report concludes that extraction without measures to limit environmental impact will lead to extensive pollution. Likewise, the EIA report concludes that further studies should be carried out in a number of areas. Jørgensen also emphasized that staff must be hired who can monitor compliance with regulations once the mine is in operation. However, these reservations were expressed in an academic language

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with lots of subjunctive constructions and adverbs, which made translation difficult. With its factual, scientific style, the third presentation was thus adding to the atmosphere of good governance, professionalism, and authority associated with scientific discourse (Fairclough, 1992; Baker, 2006), inspiring trust and confidence, even though the presentation touched on sensitive risk issues.

The atmosphere of security, trust, and good governance, which was promoted *inside* the hall, was counteracted by a demonstration taking place *outside* the hall. The demonstration could not be seen on TV, and it was completely ignored by the moderator, emphasizing that only disciplined voices should be heard. Nevertheless, the demonstration outside could be heard very clearly inside the hall and on several occasions drowned out the meeting itself, so that the interpreter had difficulty translating. Outside, there was an atmosphere of anger, indignation, and rebellion, driven by a sense of unity and community. Slogans were shouted rhythmically, alternating with the protest movement's song against uranium mining. Obviously, the demonstration outside had the intention of disrupting and undermining the disciplined atmosphere that was being built inside. The loud demonstration was silently present inside, where some of the participants wore red vests with the yellow anti-uranium logo and the text *uraani naamik* (uranium no).

While the first two speakers took the same position as the moderator and completely ignored the demonstration outside, the third speaker asked the audience "in the red shirts" to go out and ask "their friends" to quiet down, before beginning his presentation. Later, as the music outside drowned out his speech, he suggested that the audience started dancing. In such moments, a crack occurred in the otherwise sharp separation between the two spaces: inside and outside. The crack revealed the strongly opposed emotions that prevailed around the subject. As opposed to the emotional meaning-making represented by the first two speakers especially, the participants in the demonstration outside invested hope for the future in stopping the project. As demonstrated by the red vests with the yellow anti-uranium logo, this opinion was shared by a large proportion of the participants inside the room.

This contradiction became even clearer in the second half of the meeting, where the audience was allowed to ask questions. Despite the fact that all panelists maintained a matter-of-fact, friendly, and accommodating tone, even when exposed to direct attacks from the questioners, the atmosphere in the hall became more and more strained – maybe even hostile in some parts. People asked questions but did not feel they were getting any real answers. In particular, the fact that there was no possibility to follow up on the questions after the answer from the panel aroused frustration. A woman tried to code-switch from Greenlandic to Danish in order to address the Danish-speaking panelists directly, avoiding the tedious translation. However, her intervention was ignored, as her remarks were translated anyway and answered in the same neutral tone as all the other questions

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and remarks. Even when a person asked if the company would demand compensation if the citizens succeeded in getting the project closed, the answer he received was a long account of the usefulness of the consultation process. Paradoxically, in the logic of the mining apparatus, even the most critical questions help to create an atmosphere of good governance, because all questions will be heard and answered. As simply stated by John Mair, "We [Greenland Minerals] use best practice!" Or as stated by Jørgen T. Hammeken-Holm, "We [Greenland] have the world's best Minerals Act!" The mining project and its legitimacy, indeed, took center stage and overshadowed any critical questions.

Seen from one perspective, it appears as if the demonstrators outside were undermining the democratic process (i.e., the "system" itself) by making it difficult for the speakers to be heard. From another perspective, it can be argued that they rescued the democratic process, because no room had been created for divergent voices in the mining apparatus inside. In fact, the citizens were trying to live up to the requirements that the Minerals Act places on them as active and co-responsible citizens. The constant flow of publications issued by the Greenlandic government regarding the extractive industries and large-scale projects has repeatedly emphasized the importance of citizens contributing their local knowledge: "The public can possess knowledge of practical conditions (e.g., weather and road conditions) that improve a raw material project or minimizes the inconvenience to those citizens who live close to the mine" (Naalakkersuisut, 2013: 6). For example, a citizen opposed the EIA-report's statement that there is thirty-one hours of southern wind per year in the Narsaq area. The citizen pointed out that in the period in which the hearings had been held alone, there had already been thirty-one hours of wind from the south. According to this citizen, the equipment that makes the measurements is set up in a place where there is often no wind, even though there are storms everywhere else. The statement was met by a very long and very technical answer that did not seem to contain any clarification. Nevertheless, the moderator concluded that an answer had now been given and proceeded to the next question.

Thus, the meeting ended in an atmosphere of anticlimax, without the parties having approached each other or obtained any clarification of the issues on which the meeting intended to shed light. This observation was repeated by the participants on social media and interviews given to Danish and Greenlandic news media. Also, the absence of political representation to discuss this as more than a technical challenge left most questions still to be answered.

Time and Legitimacy

Time and its production are a key part of the apparatus of mining hearings. The premise is that the mining company expects and performs mining as something

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that will take place in the near future. Thus, at the point when hearings take place it is still very unclear whether a project will proceed. Nevertheless, the temporality presented at hearings is inscribed in a game of power over when and if the project can proceed. Zooming in on the presentation of Johannes Kyed from Greenland Minerals, any assumption about a possible contradiction between outside businessmen, scientists, and local Greenlanders is counteracted by his presentation in Greenlandic. Kyed (who is from South Greenland himself) reminded the audience about his own engagement since 2008, the different steps in the project and the urgency of the global green transition, Greenland's economy, and the jobs in Narsaq. He illustrated the process since 2007 with PowerPoint slides in order to emphasize what he understood as a long timespan. In one of the slides the headline was "Societal gains," illustrated with a graph showing the prospects for Greenland's national economy to combat Greenland's "Death's gap" followed by the upbeat invitation: "We can close the gap in Greenland's economy!" Thus, Kyed constructed a collective "we" made up by a united society: the Greenland Self Government and Greenland Minerals. However, this upbeat version did not align with the general atmosphere in the room, where most of the audience had their arms crossed and sparsely applauded his presentation.

Kyed was trying his best to evoke an affective community that, according to his presentation, was formed back in 2008 as the first meetings started. The creation of this timeline also evoked an image of Narsaq as a community with long-term involvement and thus also responsibility and moral obligation to the project. The presentation represented the local community as part of the temporality of the mining project, and the division of labor was described in the following way: "At the first meetings we as company facilitated and you were involved in back, and it was expressed that the work needed to be done with the most value [for society]." The argument seems to be that the company had been working for the community that along the line had assigned it a specific task (i.e., create as much value as possible). In other words, we [Greenland Minerals] just did what you told us to, and more than twelve years have passed – and we kept our part of the deal!

Time becomes an argument in itself. According to the anthropologist Nathalia Brichet (2018), time is often mobilized in the making of minerals in Greenland. Thinking about time through resource projects is a general trend in how mining is communicated. Kyed's presentation in Narsaq in 2021 was one of many presentations about the project by Greenland Minerals all over the world at conferences in Australia, China, Canada, Denmark etc. from 2013 to 2021. Forms of temporality are organized in particular ways for the minerals to become valuable and to establish a "license to operate," as it was already stated on Greenland Minerals' slides at the mining conference PDAC in Toronto in 2016 (Figure 7.1). In 2016, the slides were not accompanied by a precise year. They only illustrated

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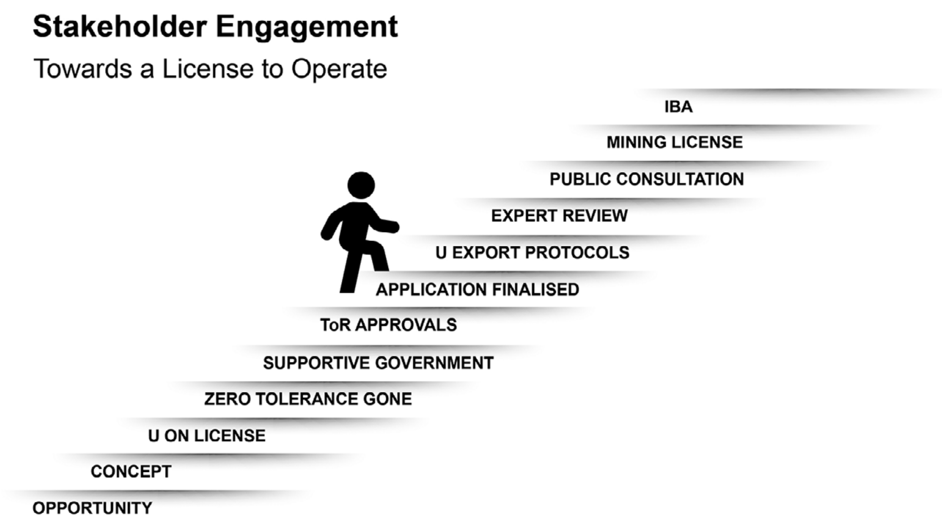

Figure 7.1 A replica of a slide from Greenland Minerals and Energy Limited's presentation at the PDAC Convention 2016 organized by the Prospectors & Developers Association of Canada. Graphics: Morten Grønnegaard

an upward movement, and through this the realization of the project would emerge. From this slide you get the impression that it is not a long way to go and that all steps on the ladder are equal in workload. There are no hindrances on the way to the top, and the license to operate is part of a natural movement upward. When the company evokes a temporality of evolution it also mobilizes positive affects for this kind of temporality and negative affects to statements contesting timeline progression.

Time is creatively illustrated like a staircase, but according to our analysis, it is more like an endless escalator where more and more stairs appear. The dominant narrative links to an understanding of the process as smooth and that the only way is up with no barriers and setbacks and a process that is disciplined by the apparatus. In 2018, "long-term stakeholder engagement" is illustrated by a timeline going from 2007 to 2017 (Figure 7.2). The fact that citizens have been part of the process for more than a decade is used as an argument legitimizing the project itself. On the slide it stated that "a solid foundation is in place." Even though they have only moved one step and added yet another step in two years, they characterize this as an "actionable development path forward for 2018" (Figure 7.2). In other words, time itself becomes central in managing minerals and Greenland's future as a mining country. It is also within the temporal framework that citizens are evoked as particular subjects moving

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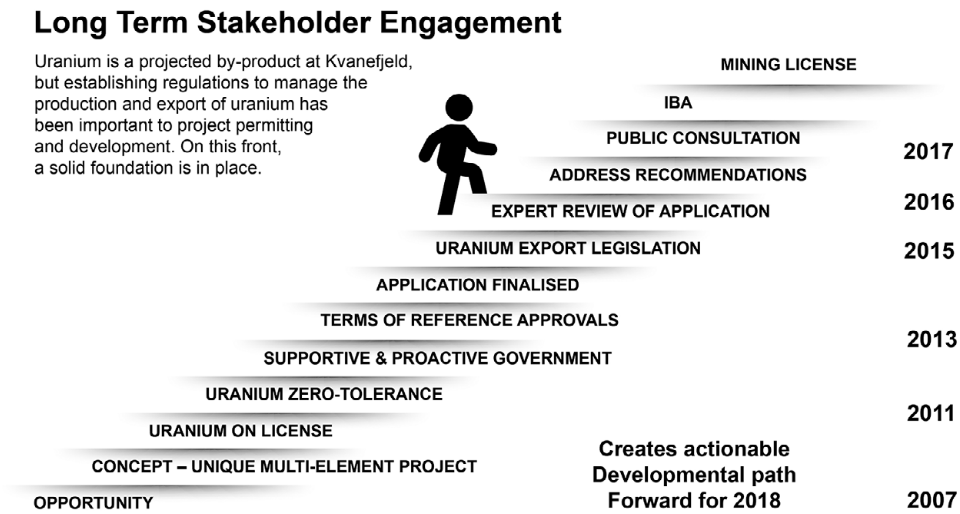

Figure 7.2 A replica of a slide from Greenland Minerals and Energy Limited's presentation at the PDAC Convention 2018 organized by the Prospectors & Developers Association of Canada. Graphics: Morten Grønnegaard

in concordance with the flow and phases of the project "up the stairs," so to speak. Citizens are allowed to perform and be included in certain ways at each step. In effect, their legitimate room for maneuver can be interpreted as limited (Faurschou, 2021: 4). If they are *not moving forward* in the process as laid out it is understood as violating the hearing process and the future of the project.

The hearing shows that mining projects are as much about futures as about mining (Sejersen, 2020). The futures are creatively scaled in all directions in order to link project activities to certain affects. The company upscaled a future narrative where the metals from the mine would underpin Greenlandic independence and accelerate the world's green transition. This kind of time- and future-making stood in sharp contrast to the downscaled future narratives of residents in Narsaq, which focused on the health of local people and the wellbeing of the community. Another contrast that emerged was one between the abstract models and systems of the apparatus on the one hand and the concrete experienced lifeworld of people. The focus was on the temporalities of the mine and not the community.

The Disciplining of Voices

Kuannersuit was politically framed and legitimized. These casualties of mining as framed by policymakers situate the mining project in a highly sensitive arena,

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which has been challenged (see, e.g., The Committee for Greenlandic Mineral Resources to the Benefit of Society (Rosing, 2014)). But these highly speculative casualties are translated into "facts" as they are situated *on par* with other project facts. A highly political question is therefore transferred into what has been cultivated as a non-political sphere. James Fergusson (1990) uses the phrase "the anti-politics machine" to describe this rhetorical move. Highly complex political issues and decisions emerge as purely technical and fact-based. The diversity of political voices and ideas is compressed and filtered into the technical rationality of the mining project, which underlines its central position. Voices at the hearing are thus disciplined to think in a particular way: Their complex concerns and hopes about the small and big futures must have the project as a central driver.

The mining project is the only future horizon to navigate, and it is isolated from other alternative futures. Therefore, statements (or rather questions and answers) are disciplined, shaped, and tamed accordingly. Highly political matters are turned into a simple exchange of "information" and "facts." By pursuing a question/answer configuration of the event, the mining project itself becomes the organizing device of thinking about futures, which is a fraught topic in Arctic discourse, locally and pan-Arctic (Wormbs, 2018). Hence, voices are disciplined to narrow their future-making in particular directions laid out by the project, as manifested in the bureaucratic procedures and rationalities as well as in the avalanche of documents. On the one hand, this reduces complexities and emotional maneuver room (limits thinking about what constitutes a good life in Narsaq), as it only allows certain ways to address the future of the community (ideas, hope, and concerns have to be wrapped in project terms). On the other hand, the apparatus itself that drives the momentum, focus, and legitimization of the process can become invested with emotions. This is indeed an interesting paradox.

In particular, trust seems to be the emotion that is mobilized and invested in the process. During the event, the company, the authorities, and specialists concurrently referred to the requirements laid out in the regulations and standards decided on by the authorities, including "best practice" etc. In fact, the regulation became an argument in itself when answering questions. Technical questions were answered by reference to the fact that procedures (assessments etc.) have followed the regulations and requirements. Thereby, the answer was enveloped in mobilizing trust in the system. "Good," "security," "trust," and "no-fear" were glued to the rules and procedures of the apparatus.

During the hearing, few attempts were made by the company to engage the temporalities of the mine with the temporalities of the community. Because the company solely focused on finding and legitimizing the best possible mining set-up, the company was neither able nor competent to address the imminent question that all residents struggled with: In what way would the community like to protect

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and transform itself, its values, and its social relations? The cluster of optimism (Berlant, 2011: 23) that constituted the desires attached by the company and authorities to the mining project was challenged by the audience's infusion of distrust. This affective move – during the event – evoked the relation to the mining project as cruel optimism (Berlant, 2011: 1), where the company's desire to mine would constitute an obstacle to the community's flourishing. During the event, the company was unable to create an atmosphere of hope because it worked within the logics of the mining apparatus and upscaled the potential benefits of the mine to such an extent that Narsaq and its residents were turned into means to a goal outside their everyday life.

When residents ask "what is going on?" and "what is going to happen?" it is a process of complex sensemaking that draws on a multitude of affects and also takes place outside the formal process of the mining apparatus (Weick, Sutcliffe, & Obstfeld, 2005). In a critical review of Greenlandic hearing practices and structures, Aaen (2012) points out that many of the problems at the hearings emerge because the Greenlandic authorities have not been clear about what they want to achieve. However, Greenland's Mineral Strategies are actually very clear with respect to the purpose of the hearings. The hearings are supposed to create goodwill toward the mineral resources company and to boost and smooth the process for the mining companies (Naalakkersuisut, 2014, 2020). This further supports Aaen's conclusion that hearings easily become a proforma activity that must be overcome in order for the companies to move forward in the application process. We agree with Aaen (2012: 14) that this is probably in reality the biggest barrier to meaningful engagement of the public. Aaen (2017: 93) therefore suggests that the central question about "What is going on?" must, to some extent, be answered from the point of view of the social. Fundamentally, this means that the project should adapt to the lifeworld of citizens rather than require the citizens to adapt to the project.

The Significance of the Affective in the Analysis of Mining

By using an affective analytical approach in understanding extractivism we have demonstrated how emotions are always present, even when the opposite is claimed. Affects and emotions emerge as essential social drivers within planning, advocating, modifying, or banning extractive projects. The analysis has shown how affects are used productively to evoke legitimacy and trust. We have shown how the orchestration of atmosphere and the disciplining of voices hindered a meaningful conversation with and integration of local citizens. Hence, such an analytical attention opens up the black boxes of the mining apparatus, in this case the part belonging to the consultation process.

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Our affectual analysis opens up a number of points of attention that can be useful to observe carefully in the study and organization of consultation processes:

EVENTS:	Public hearings are pivotal contact zones and arenas for affectual exchange. In what ways do the orchestration of hearings work actively to open or close spaces for the legitimate airing of emotions?
TIME:	Affects and temporality are often closely connected. The orchestration of hearings works actively with time, and by doing so also the emotions that are invested. What hierarchies are installed by the use of temporality and how are voices and imaginations disciplined?
ANTICIPATION:	Hearings are arenas to negotiate and anticipate futures. Many emotions are at stake in such future-making. What emotional hierarchies are established, and how do these hierarchies affect meaning-making and imagination?
FACTS:	Hearings, often, work with a hegemonic understanding of "truth." Ideas about "facts" and the knowledge regime that legitimizes these "facts" are part of the mining project apparatus. Affects are invested in this praxis of fact-production. How can hearings legitimize perspectives, testimonies, and witnesses that are not easily demarcated as "facts"?
GRAVITY:	The present apparatus has the mining project as the hegemonic center. As a central force it pulls everything in its own direction. In what ways can community futures take center stage in the elaboration of the mining project?
ATMOSPHERE:	Hearings are dense contact zones, and much is invested in creating and cultivating a certain atmosphere. How can they be orchestrated in order to recognize a multiplicity of voices?
TRANSFORMATION:	Reflections on mining implementations are closely entangled with discussions about societal transformations. How does the political system secure citizens' formal opportunity to engage in a qualified discussion of how society should and could be transformed – before the mining project sets the agenda?

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Notes

1 These and following quotations from the hearings quoted from Kuannersuit pillugit tusarniaaneq – Narsamiit Nal. 19.00 (1:2) KNR 09.02.2021, https://knr.gl/da/tv/aatsitassarsiornermut-suliniut-kuannersuit/kuannersuit-pillugit-tusarniaaneq-narsamiit-nal-1900, translations by the authors.

2 Or "emotional turn." The two terms, affects and emotions, are used more or less synonymously by many researchers and by some with intent. The distinction between affects as universal, non-personal experiences of the body and emotions as culturally determined, conscious processes is contradicted by many researchers, who want to abolish the dichotomy between body and consciousness, see e.g., Bille and Simonsen (2021).

3 These and following quotations from the hearings quoted from Kuannersuit pillugit tusarniaaneq – Narsamiit Nal. 19.00 (1:2) KNR 09.02.2021, https://knr.gl/da/tv/aatsitassarsiornermut-suliniut-kuannersuit/kuannersuit-pillugit-tusarniaaneq-narsamiit-nal-1900, translations by the authors.

References

Aaen, S. B. (2012). *Demokratisk legitimitet i høringsprocesser i forbindelse med storskala-projekter i Grønland*. Nuuk: Grønlands Arbejdsgiverforening.

Aaen, S. B. (2017). *Understanding Citizen Action in Infrastructure Development Processes, Aalborg: Aalborg Universitetsforlag*. Ph.D. serien for det Tekniske Fakultet for IT og Design, Aalborg University.

Ackrén, M. (2016). Public consultation processes in Greenland regarding the mining industry. *Arctic Review on Law and Politics*, 7(1), 3–19. http://dx.doi.org/10.17585/arctic.v7.216

Anderson, B. (2016). *Encountering Affect. Capacities, Apparatuses, Conditions*. London and New York: Routledge.

Arctic EIA project (2019). *Good Practices for Environmental Impact Assessment and Meaningful Engagement in the Arctic: Including Good Practice Recommendations*. Online report. https://arcticeconomiccouncil.com/wp-content/uploads/2020/07/arctic-eia_final-report_may-2019.pdf

Austin, J. L. (1975 [1962]). *How to Do Things with Words*, 2nd ed., Cambridge, MA: Harvard University Press.

Baker, M. (2006). *Translation and Conflict: A Narrative Account*. London: Routledge.

Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC and London: Duke University Press.

Basse, E. (2014). *Juridisk responsum om den gældende grønlandske lovgivning vurderet i lyset af Århuskonventionen*. Nuuk: Departementet for Miljø og Natur.

Berlant, L. (2011). *Cruel Optimism*. Durham, NC and London: Duke University Press.

Bhabha, H. (1994). *The Location of Culture*. London: Routledge.

Bille, M. and Simonsen, K. (2021). Atmospheric practices. On affecting and being affected. *Space and Culture*, 24(2), 295–309. https://doi.org/10.1177/1206331218819711

Bjørst, L. R. (2011). *Arktiske diskurser og klimaforandringer i Grønland. Fire (post) humanistiske klimastudier*. Unpublished PhD thesis, University of Copenhagen.

Bjørst, L. R. (2016). Saving or destroying the local community? Conflicting spatial storylines in the Greenlandic debate on uranium. *The Extractive Industries and Society*, 3(1), 34–40. https://doi.org/10.1016/j.exis.2015.11.006

Bjørst, L. R. (2017). Uranium: The road to "economic self-sustainability for Greenland"? Changing uranium-positions in greenlandic politics. In G. Fondhal and G. N. Wilson, eds., *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Cham: Springer, pp. 25–34.

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Bjørst, L. R. (2020). Stories, emotions, partnerships and the quest for stable relationships in the Greenlandic mining sector. *Polar Record*, 56, 1–13. https://doi.org/10.1017/S0032247420000261

Böhme, G. (1995). *Atmosphäre: Essays zur Neuen Ästhetik*. Frankfurt/Main: Suhrkamp.

Bourdieu, P. (1977). *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Brichet, N. (2018). Timely rubies: Temporality and Greenlandic gems. *The Extractive Industries and Society*, 5(2), 267–273.

Brosius, J. P. and Campbell, L. M. (2010). Collaborative event ethnography: Conservation and development trade-offs at the fourth world conservation congress. *Conservation and Society*, 8(4), 245–255.

Brøns, M. (2021). Naalakkersuisut har modtaget bombetrusler på grund af Kuannersuit. *Kalaallit Nunaata Radioa online article*. https://knr.gl/da/nyheder/naalakkersuisut-har-modtaget-bombetrusler-p%C3%A5-grund-af-kuannersuit

Campbell, L. M., Corson, C., Gray, N. J., MacDonald, K. I., and Brosius, J. P. (2014). Studying global environmental meetings to understand global environmental governance: Collaborative event ethnography at the tenth conference of the parties to the convention on biological diversity. *Global Environmental Politics*, 14(3), 1–20. https://doi.org/10.1162/GLEP_e_00236

Clough, P. (2008). The affective turn: Political economy, biomedia and bodies. *Theory, Culture and Society*, 25(1), 1–22. https://doi.org/10.1177%2F0263276407085156

Dodds, K. and Nuttall, M. (2016). *The Scramble for the Poles: The Geopolitics of the Arctic and Antarctic*. Cambridge: Polity Press.

Durkheim, E. (2008 [1912]). *The Elementary Forms of Religious Life*. Oxford: Oxford University Press.

Elias, N. (2010 [1939]). *Über den Prozess der Zivilisation*. Frankfurt am Main: Suhrkamp.

Fairclough, N. (1992). *Discourse and Social Change*. Cambridge: Polity Press/ Blackwell.

Faurschou, K. I. (2021). *Governmentality, subjektskabelse og minedrift. En analyse af Grønlands Selvstyres italesættelse af subjekter i forbindelse med borgerinddragelse omkring mineprojekter i Grønland*. Unpublished Master's thesis, University of Copenhagen.

Febvre, L. (1941). La sensibilité et l'histoire: Comment reconstituer la vie affective d'autrefois? *Annales d'Histoire Sociale*, 3(1–2), 5–20.

Fergusson, J. (1990). *The Anti-Politics Machine*. Cambridge: Cambridge University Press.

Greco, M. and Stenner, P. (2008). Introduction: Emotion and social science. In M. Greco and P. Stenner, eds., *Emotions: A Social Science Reader*. London: Routledge, pp. 1–21.

Grønlandsportalen (2021). Mineralmyndigheden, Mineral Resources Authority. Website. https://govmin.gl/

Hansen, A. M. (2010). *SEA Effectiveness and Power in Decision-Making*. Unpublished Ph. D. Thesis, Aalborg University.

Hansen, A. M. and Johnstone, R. L. (2019). In the shadow of the mountain: Assessing early impacts on community development from two mining prospects in South Greenland. *Extractive Industries and Society*, 6(2), 480–488. https://doi.org/10.1016/j.exis.2019.01.012

Hansen, A. M. and Kornøv, L. (2010). A value-rational view of impact assessment of mega industry in a Greenland planning and policy context. *Impact Assessment and Project Appraisal*, 28(2), 135–145.

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Hansen, K. G. (2014). Greenlandic perspectives on offshore oil and gas activities: An illustration of changes in legitimacy related to democratic decision processes. *Journal of Rural and Community Development*, 9(1), 134–154.

Hastrup, F. and Lien, M. E. (2020). Welfare frontiers? Resource practices in the Nordic Arctic anthropocene. Anthropological Journal of European *Cultures*, 29(1), https://doi.org/10.3167/ajec.2020.290101

Heinämäki, L. (2020). Legal appraisal of Arctic Indigenous peoples' right to free, prior and informed consent. In T. Koivurova, E. G. Broderstad, D. Cambou, D. Dorough, and F. Stammler, eds., *Routledge Handbook of Indigenous Peoples in the Arctic*. London: Routledge, pp. 335–351.

Højgaard, L. and Søndergaard, D. M. (2010). Multimodale konstitueringsprocesser i empirisk forskning. In S. Brinkmann and L. Tanggaard, eds., *Kvalitative Metoder: En grundbog*. Copenhagen: Hans Reitzels Forlag, pp. 315–339.

Johnson, N. (2020). Extractive energy and Arctic communities. In K. S. Coates and C. Holroyd, eds., *The Palgrave Handbook of Arctic Policy and Politics*. Cham: Palgrave Macmillan, pp. 97–116.

Naalakkersuisut. (2009). Mineral Resources Act. Explanatory Notes to the Bill. Online official document. https://govmin.gl/wp-content/uploads/2019/11/Explanatory_notes_to_the_mineral_resources_act.pdf

Naalakkersuisut. (2013). Råstofredegørelsen 2013. Online report. https://naalakkersuisut.gl/~/media/Nanoq/Files/Publications/Raastof/DK/Raastofredegoerelsen_2013_DA.pdf

Naalakkersuisut. (2014). Greenland's oil and mineral strategy 2014–2018. Online report. https://naalakkersuisut.gl/~/media/Nanoq/Files/Publications/Raastof/ENG/Greenland%20oil%20and%20mineral%20strategy%202014-2018_ENG.pdf

Naalakkersuisut. (2020). Greenland's Mineral Strategy 2020–2024. Online report. https://govmin.gl/publications/greenlands-mineral-strategy-2020-2024/?ind=1584641534605&filename=Greenlands_Mineral_Strategy_2020–2024.pdf&wpdmdl=8360&refresh=616d76f35030d1634563827

Nuttall, M. (2012a). The Isukasia iron ore mine controversy: Extractive industries and public consultation in Greenland. *Nordia Geographical Publications Yearbook*, 41 (5), 23–34.

Nuttall, M. (2012b). Imagining and governing the Greenlandic resource frontier. *The Polar Journal*, 2(1), 113–124. https://doi.org/10.1080/2154896X.2012.679563

Nuttall, M. (2013). Zero-tolerance, uranium and Greenland's mining future. *The Polar Journal*, 3(2), 368–383. https://doi.org/10.1080/2154896X.2013.868089

Nuttall, M. (2015). Subsurface politics: Greenlandic discourses on extractive industries. In L. C. Jensen and G. Hønneland, eds., *Handbook of the Politics of the Arctic*. Northampton, MA: Edward Elgar, pp. 105–127.

Olsen, A-S. H. and Hansen, A. M. (2014). Perceptions of public participation in impact assessment: A study of offshore oil exploration in Greenland. *Impact Assessment and Project Appraisal*, 32(1), 72–80. http://dx.doi.org/10.1080/14615517.2013.872842

Rokka, J. (2010). Netnographic inquiry and new translocal sites of the social. *International Journal of Consumer Studies*, 34(4), 381–387. https://doi.org/10.1111/j.1470-6431.2010.00877.x

Rosenwein, B. H. (2006). *Emotional Communities in the Early Middle Ages*. Ithaca, NY: Cornell University Press.

Rosing, M., ed. (2014). *The Committee for Greenlandic Mineral Resources to the Benefit of Society: To the benefit of Greenland*. Nuuk and Copenhagen: Ilisimatusarfik, University of Greenland.

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Sejersen, F. (2015). *Rethinking Greenland and the Arctic in the Era of Climate Change*. London: Routledge.

Sejersen, F. (2018). Scaling sustainability in the Arctic. In U. P. Gad and J. Strandsbjerg, eds., *The Politics of Sustainability in the Arctic: Reconfiguring Identity, Space and Time*. London: Routledge, pp. 94–107.

Sejersen, F. (2020). Brokers of hope: Extractive industries and the dynamics of future-making in post-colonial Greenland. *Polar Record*, 56(E22), 1–11. https://doi.org/10.1017/S0032247419000457

Sejersen, F. and Thisted, K. (2021). Mining emotions: Affective approaches to resource extraction. In D. Nord, ed., *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action*. Cham: Springer Polar Sciences, pp. 369–389.

Thisted, K. (2020). Emotions, finances and independence: Uranium as a “happy object” in the Greenlandic debate on secession from Denmark. *Polar Record*, 56, E1. https://doi.org/10.1017/S0032247419000433

Thisted, K., Sejersen, F., and Lien, M. (2021). Arctic Uchronotopias: Resource extraction, community making and the negotiation of Arctic futures. *Polar Record*, 57, e28. https://doi.org/10.1017/S0032247421000231

Thrift, N. J. (2007). *Non-Representational Theory: Space, Politics, Affect*. London: Routledge.

Vallgårda, K. (2013). Følelseshistorie: Teoretiske brudflader og udfordringer. *Kulturstudier*, 4(2), 87–113. https://doi.org/10.7146/ks.v4i2.15521

Weick, K. E., Sutcliffe, K. M., and Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science*, 16(4), 409–421. https://doi.org/10.1287/orsc.1050.0133

Wetherell, M. (2012). *Affect and Emotion: A New Social Science Understanding*. London: Sage Publications

Wormbs, N., ed. (2018). *Competing Arctic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan.

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8

Extraordinary Underground

Fear, Fantasy, and Future Extraction[1]

VESA-PEKKA HERVA, TERESA KOMU, TINA PAPHITIS

Introduction

During a cold winter in a small town in the high North, strange things are happening. In the darkness of a deep underground mine, a mysterious white object is found. This is the starting point of *White Wall* (Salmenperä, 2020) a Finnish-Swedish television mystery drama that premiered in 2020. The eight-part series occurs in a fictional mining town in northern Sweden, site of the world's largest nuclear waste depository. With its slogan, "Are all mysteries meant to be solved?," *White Wall* is a tale of humankind's limited understanding of nature and the universe. An underground mine located in the high latitude comprises a particularly fitting backdrop for pursuing such a theme, as both the subterranean world and the high North have long been regarded as extraordinary and mysterious places (e.g., Davidson, 2005; Naum, 2016; Herva & Lahelma, 2019; Herva, Varnajot, & Pashkevich, 2020).

The repurposing of the mine in *White Wall* brings together the past and future, realities and fantasies, and hopes and fears, and it is within a similar frame that we discuss extractive industries in this chapter. Contemporary perceptions and discourses of Arctic mining are linked to concerns of local and global futures, especially in relation to climate change and its diverse ramifications for the Arctic and the world. The European far North and its resources have long been associated with hopes for a better future through extraction: The discovery of silver from northern Swedish mountains in the seventeenth century triggered hopes of colonial wealth in Sweden, and in the eighteenth century the North became a land of the future where opportunities and riches awaited exploitation. The representation of both the North and the subterranean in *White Wall* replicates centuries' old imaginations of the far North and of the underground as mysterious and enchanted worlds, with both ideas converging in the context of mines and mining.

This chapter explores how extractive industries in the Arctic, and more generally, are entwined with such beyond-the-rational conceptualizations and the associated

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long-running fears and dreams linked to otherworldliness and danger but also treasure and a better future. These ideas and perceptions have a substantial affective potential, which is evident in historical and contemporary discourses of mining and the North. “The North” has been a continuous target of outside projections with various cultural, scholarly, and imaginative constructions since classical antiquity (Byrne, 2013: 7; Herva & Lahelma, 2019), commonly associated with features evoking connotations with death, coldness, barrenness, desolation, and remoteness (Hansson, 2012; Ryall, 2014: 122, 124). Alongside this, however, there is also a long tradition of placing visions of upcoming prosperity in the North. For example, the ancient Greeks believed that, beyond the barrenness and cold of the far North, a paradise of peace and plenty existed. The utopian visions regarding the North may have been fueled by the fact that the region was for centuries a source of many coveted treasures: furs, amber, ivory, and magical unicorn horns (Davidson, 2005: 51, 24). This entanglement of underground and Arctic imaginaries thus complicates our understanding of extractive industries in the region, and we demonstrate here that more attention should be paid to such phenomena.

We propose that the controversies around and affective qualities of contemporary mines and mining are entangled with the broader cultural ideas and perceptions of the subterranean. These ideas may not always be readily obvious or consciously recognized, but they nonetheless comprise a “sound board” that can amplify emotional responses to mines and mining. We explore how the cultural heritage of very long-term human entanglements with subterranean and extractive practices feature in perceptions of and attitudes to mining. As few people have extensive first-hand experience of the subterranean world, popular culture – here exemplified by *White Wall* – plays a central role in reproducing to the wider public centuries- and millennia-old cultural motifs associated with the underground realm. The emotional and affective power of mines and mining – their ability to elicit responses such as fear, excitement, and fascination – goes “beyond-the-rational” (Wright, 2012: 1113), which must be accounted for in order to unravel our complex historically and culturally mediated relationship with the world underneath.

Underground Worlds

The story of *White Wall* begins when, from the depths of an underground mine that is being repurposed as a storage facility for nuclear waste, a white wall is found. The wall turns out to have some kind of agency, and it is questioned throughout the series whether the wall would have been better left undiscovered. The storyline repeats an age-old cultural motif of the underground as a place with supernatural properties, as discussed in this section. Exploring the depths of an underground

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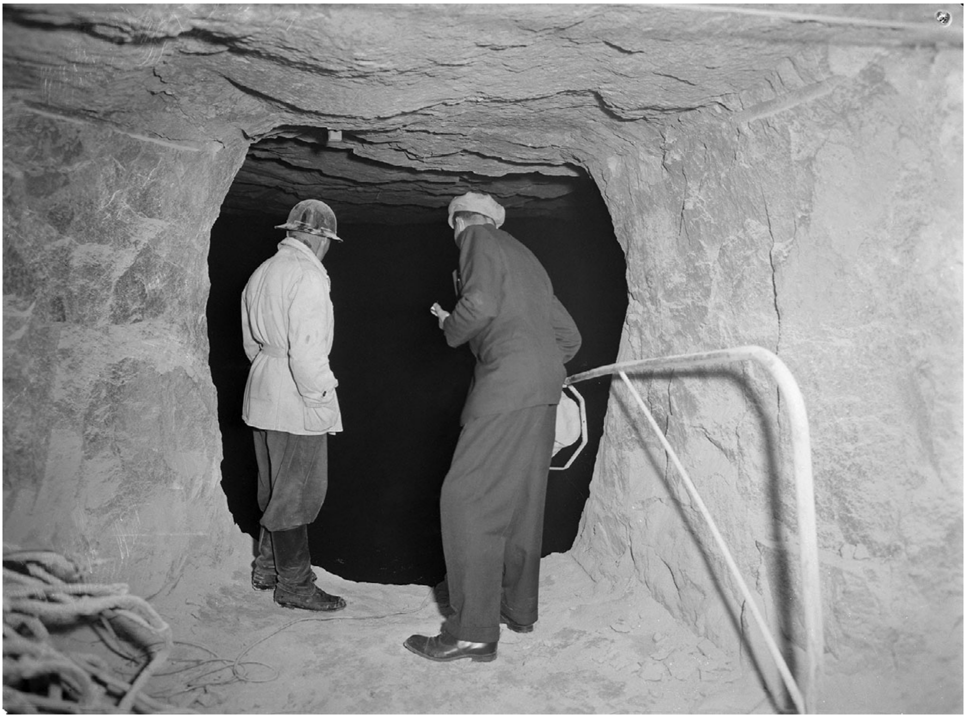

Figure 8.1 Facing the subterranean world in the limestone mine of Hangelby, Sipoo, 1956. Photo: Erkki Voutilainen/Finnish Heritage Agency. CC BY 4.0

world can reveal wonders and bring wealth, but the exploration of a forbidden or non-human domain can just as well unleash terror and destruction (Figure 8.1).

Rich orebodies linger in a space between imaginaries and reality, with agency-like qualities assigned to them, and having an aura of otherworldliness, similar to how treasures are described in folklore. Treasures are (potentially) material but simultaneously spectral, extraordinary, and otherworldly (Dillinger, 2011). Both hidden treasures and orebodies are characterized by their great potential accompanied with great uncertainty. Indeed, it is not uncommon to see metals and minerals referred to as "treasures" even in present-day Finnish news articles about mining (e.g., Malin, 2008; Ronkainen, 2018). By the same token, Norwegian Industry Minister Trond Giske boldly declared in 2010 that "God knew what he was doing when he made Norway," referring to the minerals located in Norwegian mountains, describing mineral prospecting as a "treasure hunt" (Tønset & Langørgen, 2010, authors' translation). Treasures embody the human dream of gaining happiness through sudden wealth (Sarmela, 2007: 452–459). Likewise, metals and minerals today hold a symbolic value beyond their mere material worth through their inherent promise of a better future (Engwicht, 2018: 263).

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Human life and culture have built on and been critically entangled with various subterranean realities and imaginaries for thousands of years. At the same time, however, the subterranean world has been, and still is, a strange and unknown realm that inspires awe, fear, anxiety, and fascination (Kroonenberg, 2013; Hunt, 2019). In this view, it is not by coincidence that there are signs of "ritual" activities documented in relation to caves and other (artificial or natural) openings in the ground, from prehistory to the present. Cave art research shows that underground spaces have been invested with special meaning in Europe since the Upper Palaeolithic (c. 46,000–12,000 BP) for spiritual and cosmological reasons, exemplified in cave art. The Neolithic (c. 10,000–3,300 BCE) marked the emergence of new ways of life and being in the world, which involved increased material and symbolic engagement with the subterranean world (Herva & Lahelma, 2019). The discovery of metal-making intensified engagements with the underground world further, and extractive pursuits have been intertwined with major transformations in human culture, cosmology, and society since at least the Bronze Age (c. 3,300–500 BCE). Problematic as the division of prehistory into the Stone, Bronze, and Iron Ages may otherwise be, it does illustrate the deep importance of metals and, by implication, extractive practices to the human story for a very long time. This was not simply about accessing "better" materials for tools, but metals and metal-making, including the procuring of ores, mediated environmental relations and worldviews, and affected the very organization of societies, including early state formation in the Near East and eastern Mediterranean.

Later still, the introduction of iron brought about further socio-cultural changes, and not least because iron ore was readily available, unlike copper and particularly tin. This significance of iron in huge socio-cultural shifts was to be echoed in the making of the industrial world millennia later. Iron is a particularly powerful material in European folklore from the medieval and early modern periods to recent times: fairies, ghosts, witches, and other supernatural beings fear it, culturally reflecting the power humans can gain over the supernatural and the unknown through potent treasures from the underground. In addition to bringing about myriad social, economic, and cultural transformations, industrialization further marked new scales and ways of engaging with the subterranean world, including, for example, the increased construction of underground infrastructure, which in turn was associated with such metaphysical matters as truth-seeking through excavation (Williams, 1990) in Enlightenment antiquarianism.

Modern cultures and lifestyles are built on the products of mining: aircraft, buses, trains, cars, phones, televisions, fertilisers, medical and surgical equipment, water, electricity and gas infrastructure, and the processing of solar, wind, and water energy. All these things need minerals (Taylor, 2014). We are surrounded

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and supported by products of the subterranean and underground infrastructures that effectively make possible the human world as we know it today. Yet relatively few have first-hand experience of extraction sites, which tend to be inaccessible and invisible in the everyday flow of life (Bridge, 2015). Despite advances in technology and human capability to exploit mineral resources, underground worlds still are and appear alien and unpredictable; they are deeply different from the ordinary human lifeworld aboveground and "cannot be directly visualized, touched, or manipulated outside of excavation or sampling" (Kinchy, Phadke, & Smith, 2018: 31). Underground mines, for example, are distinctive places where the boundaries between the natural and cultural are mixed and blurred. This is cinematographically shown in *White Wall*, with the subterranean as a jumble of lights, shadows, forms, and things difficult to distinguish from each other. The subterranean world is presented as governed by laws and processes distinctly different from those aboveground. Even time is experienced differently underground. Like caves, mines can similarly be imagined as "portals, worm-holes between two worlds in which time and space work differently" (Bridge, 2015).

The strangeness and otherness associated with the subterranean – whether natural caves or constructed underground spaces – is not founded only on imaginations of that unfamiliar world, but the bodily experience of them as well: "The physical geography of rock and spaces affects how a human body may encounter and experience caves, shaping sensuous and intimate underground knowledges" (Cant, 2003: 68). The peculiar bodily-sensory and cognitive effects of mines are related to the play of light, colours, sounds, material features, sense of time, and so forth, all of which creates a form of "infrastructure of enchantment" (Holloway, 2010) for curious phenomena and experiences that feed miners' folklore (see, e.g., Hand, 1942). Rather than mere anecdotes and "beliefs," historical and contemporary folklore accounts of the strange subterranean world are better understood as reflecting the complex human relationship with the subterranean, as well as the difficult conditions underground requiring special knowledges and practices.

Besides the peculiar sensory properties of subterranean spaces, the underground has yielded various tangible wonders from crystals, gems, and ores to ancient artefacts, fossils, and human remains – the wondrous wall in *White Wall* resonates readily with this broader theme. Such finds materialize and solidify many otherwise intangible notions of subterranean otherworldliness. Finnish folklore, for example, contains numerous stories about hidden treasures and instructions for obtaining them, often communicating a moral lesson about the futility of pursuing the unattainable (Sarmela, 2007: 452–459). The underground also has a transformative effect on things, as seen in alteration of organic matter, changing their appearance or constitution, or devouring them completely. This reflects the dynamic nature of the underground: it "is not fixed, inert, or lifeless," but "comes

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to be through interlinked political, economic, cultural, and technoscientific practices and processes" (Kinchy et al., 2018: 23–24; see also Kroonenberg, 2013).

Importantly, industrialization and modernization have not erased the supernatural from the lived world (e.g., Virtanen, 1992). Narratives, rituals, and supernatural beliefs continue to haunt engagements with the underground and thus affect extractive approaches and practices. One of the greatest markers of modernity and urbanity, the building of underground railways, first in London from 1863, might have *appeared* to finally dispel any vestiges of magical thinking in relation of the underground by normalizing being-in-the-underground, or colonizing the underground, through technological achievement. However, as Alex Bevan (2019) has illustrated, the London Underground is as susceptible as anywhere to supernatural associations, arising in great part from centuries-old associations of the underground as the realm of the dead and its connotations with hell. Further, classic ghost stories such as E. F. Benson's *In the Tube* (1923) have shown that fiction was inspired by the fast-accreting narratives of the eery and supernatural in the urban underground – or, simply, Gothic imaginations were inspired by being in such an environment.

It has been suggested that the dualistic nature of various spirits, such as the both malevolent and benevolent Wild Man in Renaissance Germany, occupying underground mines, has personified the simultaneous danger, uncertainty, and desirability of the mining industry (Asmussen & Long, 2019: 14, 21). The motif is also known from early modern Sweden, where the "keeper spirits" of orebodies had the same ambiguous nature (Fors, 2015). The subterranean is a place of monsters, gods, alien technology, and communities outside normal society, alongside the potential for new worlds and discoveries. Myriad books and films build on ideas of hidden underground places, natural and artificial, and feature magical, supernatural, and frightening elements, ranging from Tolkien's Middle-earth (e.g., Tolkien, 1995 [1954–1955]) to Tim Powers's *The Anubis Gates* (1983) and Jeff Long's *The Descent* (1999), to name a few. Some of these works are "genre" fiction, such as horror, science fiction, or fantasy, but similar themes appear also in mainstream culture, as exemplified by *White Wall*.

Monumental and Extraordinary

Some scenes of *White Wall* were filmed in the Pyhäsalmi underground copper and zinc mine in Finland. Pyhäsalmi (Figure 2.2) is one of Europe's deepest and oldest operative underground mines, although the plan was to close its operations in 2021 (First Quantum Minerals, 2020). The fact that some of the filming took place 700 meters below the surface has been heavily utilized in the marketing of the series. Working in such extraordinary conditions necessitated, according to the director Aleksi Salmenperä, the

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presence of a psychiatric nurse during the filming in case deep tunnels proved to be too distressing for the cast and crew members (Broholm, 2020). This echoes the special character of mines as operational environments, underscored by newspaper articles stressing the special, mysterious, unnatural, and potentially dangerous nature of working deep underground, which calls for particular safety measures in order for humans to operate there (see, e.g., Koivuranta, 2020; Myllykoski, 2020).

Working underground poses numerous physical and psychological hazards to people, and managing the non-human conditions hinges, in part, on non-human agents, such as technology. Mines are arenas where entanglements and interaction between humans and sometimes autonomous non-humans, technological or otherwise, are acutely felt and in part produced and mediated by working with mechanical and digital devices (Figure 8.2). This emphasizes the "unnatural" aspect of mines and mining, which resonates with divided and disturbing emotional responses: It is an environment where people must deal with inherent uncertainty and rely on non-humans, whether machines or spirits, not only to be successful but also to simply survive, regardless of whether workers wear "low-tech" hard hats or more "hi-tech" breathing masks (LeCain, 2009: 46–47). Mines have been compared to spaceships: both are highly engineered environments that enable survival and operation in otherwise lethal non-human, or beyond-human, conditions (LeCain 2009: 55). Modern technology is used to give humans superhuman or supernatural qualities so that they can adequately deal with the beyond-human supernature of the underground. In this sense, mining machines comprise an elementary constituent of the "ecologies" of extraction sites, which is obvious in *White Wall*. A curiously malfunctioning machine sets the plot going, and human–machine interaction is a recurrent motif both in terms of the storyline and aesthetics of the series. People, machines, and underground spaces are often shown in ways where boundaries between them are difficult to identify, which enhances the sense of the extraordinary, abnormality, and the mysterious. In the early modern period, too, mines in northern Fennoscandia were subject to intrigue that revolved around the simultaneously scientific and enchanted nature of technology and the subterranean, and human interaction with them (Naum, 2019).

Another unsettling and emotionally affective aspect of modern mines and mining is their monumental scale. Modern mining is embedded in development ideology, with the image of mining the industry wishes to convey that of "greatness of economic success linked to grandeur of technological scale and high-quality human performance," often through "repetitive proclamations about the extremely large scale of the technology" (Trigger 1997: 165–166). The sheer scale of mines evokes feelings of awe, unease, and fear in a similar way to other natural and built monuments from Niagara Falls and the Grand Canyon to pyramids and skyscrapers (e.g., Nye, 1994) (Figure 8.3). Indeed, the admiration and dread that

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Figure 8.2 A loading machine in a mine. Photo: Foto Roos/Finnish Heritage Agency. CC BY 4.0

Figure 8.3 A monumental "sacrificial" mining landscape in Kiruna. Photo: Witext/ Wikimedia Commons. CC BY 4.0

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people potentially experience when faced with new and strange technologies has been likened to a religious experience (Mikkola, 2009: 207). Huge open pits or hundreds and thousands of kilometres of tunnels and galleries underground, alongside monumental piles of waste material and massive infrastructure, also make mines seem like monstrous and constantly changing giants, “dragons” or “tricksters,” not completely controllable by humans (Ureta & Flores, 2018). Mining may represent the triumph of human control over chaotic nature through technology but underlying this are concerns that this changing giant may get out of control yet, with catastrophic consequences. It is fitting, then, that mines are often characterized as “sacrifice zones,” as Reinert (2018) discusses in his examination of a prospective mine in northern Norway: Places are destroyed or damaged both below ground and above ground in exchange for the supposed gains that the underground is expected to provide.

Mining is a thoroughly technological pursuit, and technology, in turn, has always been subject to wonder and magic, as illustrated by European travellers’ fascination with the extraordinary technology in early modern Swedish mines (Naum, 2019) or the present-day “techno-paganism” among ICT specialists (Aupers, 2009). For Gell (1988), technology is indeed a form of magic due to its power to enchant us and thus also provoke emotions. Hornborg (2015: 52) argues that “modern technology is magic. It is a specific way of exerting power over other people while concealing the extent to which it is mediated by human perceptions.” Magical thinking is not absent in spaces of modern mining and industry either, but mines can provoke supernatural experiences and narratives (e.g., Hand, 1942).

In more concrete terms, Hemminki (2020: 213) discusses the continued relationship between metallurgy and the supernatural during industrialization in Finland in the twentieth century and shows, for instance, that factory-made metal objects were thought to possess magical powers and could be used for curing diseases. Indeed, as Aupers (2009: 171) saliently points out, “technological progress may paradoxically be responsible for the growth and flowering of mystery and magic in the late-modern world.” Technology often works in mysterious ways and affords a sense and awareness of a deeply interconnected (and broadly spiritual) nature of lived and experienced reality. Mines as extraordinary spaces where diverse powers and agents are in operation readily emphasize that the world is not only about humans, but that they co-inhabit it with a host of non-human entities that have diverse influences on human life, ranging from lichen to spectral animals to ghosts and from trolls to spiritual keeper entities of ores that can manifest themselves and be experienced in various ways. In some ways, modern mines with their myriad non-human beings and powers can be compared to the age-old shamanistic ideas of the enchanted underworld.

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Magic and Volatility

Early on in *White Wall*, the viewers learn that the project to create a nuclear waste deposit in the mine has been delayed for some time. There is a pressure to open the facility as soon as possible because the company in charge is running out of money, motivating the site manager to find out the nature of the strange object found underground (the "white wall") quickly and without publicity. Money, of course, is an important driver in the drama around mines and mining in real life. It is simultaneously enmeshed in contemporary magical thinking: "capitalism and its supporting mechanisms are not often as rational as they made themselves out to be" (Moeran & Waal Malefyt, 2018: 2; see also, e.g., Hoffman, 1967 on the folklore of Wall Street). One function of magical practices is to manage with uncertainty and unpredictability (see Moeran & Waal Malefyt, 2018: 10–12), which in turn are integral aspects of both contemporary extractive industries and economies, affected by invisible, mysterious, and volatile forces of the "markets" and the "invisible hand of capital." Modern money and the markets can seem to behave quite erratically, and indeed have a life of their own and are frequently out of control, which renders them as mysterious as the premodern world with its spiritual powers, which add to the affective dimensions of such megaprojects as mines.

The growth of the finance sector over the 2000s and the increased separation of speculative economies from real economies may be particularly evident in the extractive sector that is heavily dependent on attracting enormous outside investments, which, according to Tsing (2000: 120, 127), is done through the "self-conscious making of a spectacle." Capital is conjured through magic, and excitement toward new projects is created with grandiose promises and "manufacturing of drama." In other words, the projects are made to look better than they are in order to attract finances, which make it difficult to distinguish viable mining projects from unrealistic ones (Tsing, 2000: 120, 127; see also Reinert, 2018). Simultaneously, however, mining projects may have very real and large-scale environmental and social impacts already in the planning stage of mines. This duality between the invisible (or speculative) and visible (or real) worlds can readily create discomfort and thus emotional engagement, whether "negative" or "positive," with mines and mining, alongside the environmental and aesthetic degradation that comes with them.

Perceptions of mining revolve around fear and hope, associated with notions such as mining bringing salvation to economically challenged peripheral regions or else bringing doom through destruction of the environment, with uncertain or unsubstantiated positive impacts. Through centuries, mining has been seen in negative terms as morally suspicious treasure-hunting driven by greed, as well as a positive force that generates economic and social well-being. The twenty-first century has largely been marked by a moral condemnation of greed, which is now

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seen as destructive for society, and global companies have become the icons of greed and excess (Oka & Kuijt, 2014: 36, 41, 44). For example, a quick Google search offers numerous cautionary opinion pieces where it is suggested that current mining ventures are being driven by greed (e.g., Koskiniemi, 2012; Hartio, 2015; Rutledge, 2017; Huttunen, 2018; Widdup, 2018; Prashad, 2019).

Naum (2019) observes that, in the seventeenth century, critics of mining considered it an "unnatural" and "destructive" activity, governed by greed that would cause harmful social and environmental repercussions by "wounding the organic body of the Earth." For these critics, interfering with the underground world was morally and cosmologically wrong, whereas the proponents emphasized the material and social benefits of mining – industrial work was taken to improve people and their quality of life (Naum, 2019: 2–3, 19). The "unnatural" character of mining echoes, to at least some degree, the fear of the strange and unknown subterranean realm and how the greed for harvesting its riches may bring destruction not only through natural causes but also supernatural agency – a theme that has been pursued in modern fiction.

In J. R. R. Tolkien's *The Lord of the Rings* (1995 [1954–1955]), the greedy dwarves mined too deep for their desired *mithril* in Moria, awakening an ancient demonic entity, a Balrog, which in turn results in the annihilation of the dwarf kingdom under the mountain. Similarly, the existence of the entire planet of the Na'vi is threatened by resource extraction in James Cameron's film *Avatar* (2009). Mining has come to exemplify the destructive side of modernity, as evidenced by historical and contemporary ruined, toxic, and monstrous landscapes that extractive industries produce. The real and fictional views on the destructive character of mining stem from such concrete phenomena as environmental disasters, social problems, violence, and warfare associated with mining (Ballard and Banks 2003), but cultural and cosmological ideas about the troubling nature of engaging with the subterranean otherworld are also in play, however vague and subconscious they may be.

While the real and fictive greed for underground resources can have dystopian consequences with potentially supernatural dimensions, the positive views on mining also tend to have an aspect of faith and miracle-work to them. Extractive industries are seen to generate wealth and well-being almost by magic. Mining projects are frequently portrayed, and understood among supporters, as eliciting dream-like expectations of prosperity and a better future, documented among communities of diverse cultural and geographical backgrounds. This has been demonstrated in recent research addressing expectations toward modern mining projects (Filer & Macintyre, 2006; Pijpers, 2016; Engwicht, 2018; Haikola & Anshelm, 2018; Poelzer & Ejdemo, 2018; Wiegink, 2018). Moreover, it is intriguing that, as Wilson and Stammler (2016) observe in the context of Arctic

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mining, "expectations tend to be the same, no matter how many times such expectations have been disappointed, or opportunities wasted in other regions in the past" (Wilson & Stammler, 2016: 1; see further Wormbs, 2018). This is perhaps, as Filer and Macintyre (2006: 224) suggest, because there is enough evidence of wealth generated through mining to feed fantasy-like expectations toward new mining projects.

The capacity for large-scale infrastructure to enchant and conjure excitement and hope has been discussed previously, for example in the context of road building in Peru (Harvey & Knox, 2012). Such industrial projects are not mere material forms, but inherent in them is the promise of their ability to transform the future. Harvey and Knox (2012: 523–524, 534) argue that even though industrial projects are marketed as rational projects, it is their power of enchantment that helps to understand how development projects generate hopes of a better tomorrow, even in the face of recent failures. The economically and socially transformative potential of mines is a kind of "technology of enchantment" (Gell, 1988: 7) that can generate goodwill toward industrial projects but also overrule "common sense" or conceal critical issues that might erode such beliefs (Moeran, 2017: 147–148, 150). Magic can be understood as a kind of ideal technology that inspires real technology. And, just like real mining projects are never as spectacular as ideals, the affective power of the "magical mine" is nonetheless a driver of real-life projects. As Gell (1988: 9) observes, "It is because non-magical technology is effective, up to a point, that the idealized version of technology which is embodied in magical discourse is imaginatively compelling."

Historically, there are utopian or "beyond-the-rational" dimensions to mining projects in northern Fennoscandia (e.g., Herva & Lahelma, 2019: 35–36, 40), and these cultural legacies can be identified in attitudes to contemporary northern mining projects. The idea of "treasure" comprises one link between mining and "supernatural" riches across different time horizons, dating back to at least early modern times. In Scandinavian folklore, mines and mineral deposits were thought to be owned by keeper entities, or trolls, who decided whether humans were allowed to discover orebodies and whether their mining ventures would succeed or fail; the keeper entities could, for instance, transform ores into worthless substances (Fors, 2015: 31–32, 35). There was, then, a supernatural aspect to mining and ores in a similar vein as treasures are considered to have supernatural qualities (see Dillinger, 2012), and this is where the idea of treasure intersects with extractive practices. Modern Lapland gold prospecting lore, for instance, holds that big nuggets are not simply found as a result of human activity, but nuggets also seek their finders (Partanen, 1999; Sallinen, 2017; Kultahippu.fi, 2019).

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Conclusion

Beyond-the-rational conceptualizations of the underground and of the far North today follow in long-running dreams and imaginaries linked to treasure, danger, and potential. The European far North has been conceived both as a resource space and the land of the supernatural and extraordinary (e.g., Naum, 2016; Herva et al., 2020). These visions also mediate the attitudes toward land use, affecting not only how local communities may respond to planned mining projects but also how our societies in general approach mining (Komu, 2019, 2020). Culturally, the far North has been considered an enchanted fantasyland inhabited by supernatural beings and powers – all of which renders the Arctic as a "strange" world. This in turn strikes a chord with how people have perceived mines and subterranean places for centuries and millennia. Effectively, then, Arctic mining is predominantly about engaging with otherness and otherworldliness, although extractive industries in the far North are, on the surface, about rational economic and technological projects. Seen in such a cultural-cosmological perspective, it becomes possible to recontextualize various aspects of controversies around Arctic mining; that is, they are not only about concrete and conscious matters but also cosmological and "existentialist" issues related to the perceptions of and relationships with, for instance, otherness, the unfamiliar, non-human, and unknown (Arctic and subterranean) realms.

The combined imaginaries of the underground and the European far North, in turn, have direct influences on how mines and mining are imagined and affect us. Support for, and opposition against, mining projects are built on underlying cultural dreams and meanings given to mining and metals as well as real-life developments and rational calculations (Komu, 2019). Peoples' attitudes toward mining projects do not necessarily follow, or cannot be predicted, purely by real-world developments. Local mining operations are also linked to wider sociocultural imaginaries that surpass various spatial and temporal scales (Komu, 2020), linked to myriad heritages and popular cultures. These factors are essential when it comes to considering motivations for, and engagements with, mining activities. We have created a dependency on something with which we are existentially uncomfortable.

Note

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References

Asmussen, T. and Long, P. O. (2019). Introduction: The cultural and material worlds of mining in early modern Europe. *Renaissance Studies*, 34(1), 8–30. https://doi.org/10.1111/rest.12581

Aupers, S. (2009). The Force is great: Enchantment and magic in Silicon Valley. *Masaryk University Journal of Law and Technology*, 3(1), 153–173.

Ballard, C. and Banks, G. (2003). Resource wars: The anthropology of mining. *Annual Review of Anthropology*, 32, 287–313. https://doi.org/10.1146/annurev.anthro.32.061002.093116

Benson, E. F. (1923). *Visible and Invisible*. London: Hutchinson & Co.

Bevan, A. (2019). The London underground: A supernatural subterranean heterotopia. In K. Bell, ed., *Supernatural Cities: Enchantment, Anxiety and Spectrality*. Woodbridge: The Boydell Press, pp. 186–205.

Bridge, G. (2015). The hole world: Scales and spaces of extraction. Scenario Journal 5 online article. https://scenariojournal.com/article/the-hole-world/

Broholm, U. (2020). Suomessa kuvattu jännityssarja White Wall ei ole tavanomainen pohjoismainen draama – "Sarja ei matki muita vaan hiihtelee omia latujaan". Yle Uutiset article. https://yle.fi/aihe/artikkeli/2020/10/20/suomessa-kuvattu-jannityssarja-white-wall-ei-ole-tavanomainen-pohjoismainen.

Byrne, A. (2013). *Geographies of the Romantic North: Science, Antiquarianism, and Travel, 1790–1830*. New York: Palgrave Macmillan.

Cameron, J. (2009). *Avatar*. United States: Lightstorm Entertainment, Dune Entertainment, Ingenious Film Partners.

Cant, S. G. (2003). 'The tug of danger with the magnetism of mystery': Descents into 'the comprehensive, poetic-sensuous appeal of caves'. *Tourist Studies*, 3(1), 67–81. https://doi.org/10.1177/1468797603040531

Davidson, P. (2005). *The Idea of North*. London: Reaktion Books.

Dillinger, J. (2011). *Magical Treasure Hunting in Europe and North America: A History*. Basingstoke: Palgrave.

Engwicht, N. (2018). "It can lift someone from poverty": Imagined futures in the Sierra-Leonean diamond market. *The Extractive Industries and Society*, 5(2), 260–266. https://doi.org/10.1016/j.exis.2018.02.010

Filer, C. and Macintyre, M. (2006). Grass roots and deep holes: Community responses to mining in Melanesia. *The Contemporary Pacific*, 18(2), 215–231. https://doi.org/10.1353/cp.2006.0012

First Quantum Minerals. (2020). Pyhäsalmi. Online website. www.first-quantum.com/English/our-operations/default.aspx#module-operation–pyhasalmi

Fors, H. (2015). *The Limits of Matter: Chemistry, Mining, and Enlightenment*. London: The University of Chicago Press.

Foto Roos. (unknown). Outokumpu Oy:n kuormauskone kaivoksessa. Online photograph collection of Finnish Heritage Agency. https://museovirasto.finna.fi/Search/Results?lookfor=kaivos+foto+roos&type=AllFields&dfApplied=1&limit=50

Gell, A. (1988). Technology and magic. *Anthropology Today*, 4(2), 6–9.

Hand, W. D. (1942). California miners folklore: Below ground. *California Folklore Quarterly*, 1, 127–153.

Hansson, H. (2012). An Arctic Eden: Alexander Hutchinson's Try Lapland and the Hospitable North. *Northern Review*, 35, 147–166.

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Haikola, S. and Anshelm, J. (2018). The making of mining expectations: Mining romanticism and historical memory in a neoliberal political landscape. *Social and Cultural Geography*, 19(5), 576–605. https://doi.org/10.1080/14649365.2017.1291987

Hartio, I. (2015). Dokumentti Talvivaarasta: "Ahneus aiheutti ongelmat". *Keskisuomalainen*. Online article. www.ksml.fi/paikalliset/2605104

Harvey, P. and Knox, H. (2012). The enchantments of infrastructure. *Mobilities*, 7(4), 521–536.

Hemminki, N. (2020). From professional educator to labour movement agitator: The Devil's role in an industrial context. In T. Äikäs and S. Lipkin, Eds., *Entangled Bbeliefs and Rituals: Religion in Finland and Sάpmi from Stone Age to Contemporary Times*. Helsinki: The Archaeological Society of Finland, pp. 200–224.

Herva, V-P. and Lahelma, A. (2019). *Northern Archaeology and Cosmology: A Relational View*. London: Routledge.

Herva, V.-P., Varnajot A., and Pashkevich, A. (2020). Bad Santa: Cultural heritage, mystification of the Arctic, and tourism as an extractive industry. *The Polar Journal*, 10(2), 375–396. https://doi.org/10.1080/2154896X.2020.1783775

Hoffland, D. (1967). The folklore of Wall Street. *Financial Analysts Journal*, 23(3), 85–88. https://doi.org/10.2469/faj.v23.n3.85

Holloway, J. (2010). Legend-tripping in spooky spaces: Ghost tourism and infrastructures of enchantment. *Environment and Planning D: Society and Space*, 28(4), 618–637. https://doi.org/10.1068/d9909

Hornborg, A. (2015). The political economy of technofetishism: Agency, Amazonian ontologies, and global magic. *Hau: Journal of Ethnographic Theory*, 5(1), 35–57. https://doi.org/10.14318/hau5.1.003

Hunt, W. (2019). *Underground: A Human History of the Worlds beneath Our Feet*. London: Simon & Schuster.

Huttunen, A. (2018). Mielipide: Sakatin kaivoshanke ei ole läpihuutojuttu – suojelun idea on turvata ympäristö lyhytnäköiseltä ahneudelta. Talouselämä online article. www.talouselama.fi/uutiset/mielipide-sakatin-kaivoshanke-ei-ole-lapihuutojuttu-suojelun-idea-on-turvata-ymparisto-lyhytnakoiselta-ahneudelta/eb4d7fde-a7c7-30e3-9323-e12fb85e4ac1

Kinchy, A. J., Phadke, R., and Smith, J. M. (2018). Engaging the underground: An STS field in formation. *Engaging Science, Technology, and Society*, 4, 22–42. https://doi.org/10.17351/ests2018.213

Koivuranta, R. (2020). Suomen kalleinta tv-sarjaa tehtiin hurjissa olosuhteissa 700 metrin syvyydessä pyhäjärveläisen kaivoksen uumenissa: "Silmä ei tottunut hämärään, koska valoa ei ollut fotoniakaan". Aamulehti online article. www.aamulehti.fi/televisio/art-2000007639145.html

Komu, T. (2019). Dreams of treasures and dreams of wilderness: Engaging with the beyond-the-rational in extractive industries in northern Fennoscandia. *The Polar Journal*, 9(1), 113–132. https://doi.org/10.1080/2154896X.2019.1618556

Komu, T. (2020). *Pursuing the Good Life in the North: Examining the Coexistence of Reindeer Herding, Extractive Industries and Nature-Based Tourism in Northern Fennoscandia*. Oulu: Acta Universitatis Ouluensis. Series B, Humaniora 177.

Koskiniemi, H. (2012). Puheenvuoro: Poronhoitoa uhkaa ahneus ja pedot!!! Uusi Suomi online article. http://hemmokoskiniemi.puheenvuoro.uusisuomi.fi/106131-poronhoitoa-uhkaaahneus-ja-pedot

Kroonenberg, S. (2013). *Why Hell Stinks of Sulfur: Mythology and Geology of the Underworld*. London: Reaktion.

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Kultahippu.fi. "Hippulista." Online article. www.kultahippu.fi/suurimmat-kultahiput/hippulista/

LeCain, T. J. (2009). *Mass Destruction: The Men and Giant Mines That Wired America and Scarred the Planet*. New Brunswick, NJ: Rutgers University Press.

Long, J. (1999). *The Descent*. New York: Crown Publishing Group.

Malin, R. (2008). Kaivosbuumi pelastaa Suomen korpiseudut. Talouselämä online article. www.talouselama.fi/uutiset/kaivosbuumi-pelastaa-suomenkorpiseudut/59cfb8d1-629433c8-93f3-cd08d917bdf6

Mikkola, K. (2009). *Tulevaisuutta vastaan: Uutuuksien vastustus, kansantiedon keruu ja kansakunnan rakentaminen*. Suomalaisen Kirjallisuuden Seuran toimituksia 1251. Helsinki: Suomalaisen Kirjallisuuden Seura.

Moeran, B. (2017). Magical capitalism. *Journal of Business Anthropology*, 6(2), 133–157. https://doi.org/10.22439/jba.v6i2.5409

Moeran, B. and de Waal Malefyt, T. (2018). Magical capitalism: Introduction. In B. Moeran and T. de Waal Malefyt, eds., *Magical Capitalism Enchantment, Spells, and Occult Practices in Contemporary Economies*. New York: Palgrave. pp. 1–44.

Myllykoski, P. (2020). Suomen toistaiseksi kalleinta tv-sarjaa kuvattiin Pyhäjärven kaivoksessa 700 metrin syvyydessä – White Wall on Ylen ja SVT:n ensimmäinen yhteinen suurtuotanto. Ilta-Sanomat *online* article. www.is.fi/tv-ja-elokuvat/art-2000007613823.html

Naum, M. (2016). Between utopia and dystopia: Colonial ambivalence and early modern perception of Sápmi. *Itinerario*, 40(3), 489–521. https://doi.org/10.1017/S016511531600067X

Naum, M. (2018). The pursuit of metals and the ideology of improvement in early modern Sápmi, *Sweden. Journal of Social History*, 51(4), 784–807. https://doi.org/10.1093/jsh/shx011

Naum, M. (2019). Enchantment of the underground: Touring mines in the early modern Sweden. *Journal of Tourism History*, 11(1), 1–21. https://doi.org/10.1080/1755182X.2019.1592241

Nye, D. E. (1994). *American Technological Sublime*. Cambridge, MA: MIT Press.

Oka, R. and Kuijt, I. (2014). Greed is bad, neutral, and good: A historical perspective on excessive accumulation and consumption. *Economic Anthropology* 1, 30–48. https://doi.org/10.1002/sea2.12002

Partanen, S. J. (1999). *Sankareita, veijareita ja huijareita: Lapin kullankaivajien tarina*. Tampere: Edita.

Pijpers, R. J. (2016). Mining, expectations and turbulent times: Locating accelerated change in rural Sierra Leone. *History and Anthropology*, 27(5), 504–520. https://doi.org/10.1080/02757206.2016.1222524

Poelzer, G. A. and Ejdemo, T. (2018). Too good to be true? The expectations and reality of mine development in Pajala, Sweden. *Arctic Review on Law and Politics*, 9, 3–24. https://doi.org/10.23865/arctic.v9.674

Powers, T. (1983). *The Anubis Gates*. New York: Berkley Books.

Prashad, V. (2019, February 6). Disaster capitalism in Brazil: Mining greed produces a horrific death toll. Online article. https://countercurrents.org/2019/02/06/disaster-capitalism-inbrazil-mining-greedproduces-a-horrific-death-toll/

Reinert, H. (2018). Notes from a projected sacrifice zone. *ACME: An International Journal for Critical Geographies*, 17(2), 597–617.

Ronkainen, A. (2018). Savossa on maan alla miljardien edestä skandiumia: Nyt tutkijat ovat ehkä keksineet, miten aarre saadaan ylös pilaamatta ympäristöä. Yle Uutiset article. https://yle.fi/uutiset/3-10124389

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Rutledge, C. (2017). Opinion: Mining: A fight between the needy and greedy. Independent Online article. www.iol.co.za/capetimes/opinion/mininga-fight-between-theneedy-and-greedy-10821996

Ryall, A. (2014). In love with a cold climate: Representations of the North in nineteenth-century travel writing from Scandinavia. *Journal of Northern Studies*, 8(2), 121–137.

Sallinen, M. (2017). "Veljekset tekivät vuorotellen huippulöydöt: Isoja kultahippuja nousee Lapissa nyt kuin perunoita maasta." Aamulehti online article. www.aamulehti.fi/a/200354122

Salmenperä, A. (2020). *White Wall*. Helsinki and Stockholm: Fire Monkey & NICE Drama Sweden.

Sarmela, M. (2007). *Suomen Perinneatlas: Suomen kansankulttuurin kartasto 2*, 3rd ed., Helsinki: Suomalaisen Kirjallisuuden Seura.

Taylor, R. (2014). 5 reasons why you can't live without mining. Linkedin blog. www.linkedin.com/pulse/20140423133321-61425904-5-reasons-whyyou-can-t-livewithout-mining

Tolkien, J. R. R. (1995) [1954–1955]. *The Lord of the Rings*. London: Harper Collins.

Tønset, M. and Langørgen, S. (2010). 100 mill. til gulljakt. Adressavisen online article, www.adressa.no/nyheter/okonomi/2010/10/02/100-mill.-til-gulljakt-1130651.ece

Trigger, D. S. (1997). Mining, landscape and the culture of development ideology in Australia. *Ecumene*, 4(2), 161–180. https://doi.org/10.1177/147447409700400203

Tsing, A. (2000). Inside the economy of appearances. *Public Culture*, 12(1), 115–144. https://doi.org/10.1215/08992363-12-1-115

Ureta, S. and Flores, P. (2018). Don't wake up the dragon! Monstrous geontologies in a mining waste impoundment. *Environment and Planning D: Society and Space*, 36(6), 1063–1080. https://doi.org/10.1177/0263775818780373

Virtanen, L. (1992). Have ghosts vanished with industrialism? In R. Kvideland, ed., *Folklore Processed in Honour of Lauri Honko on his 60th Birthday*. Helsinki: Suomalaisen Kirjallisuuden Seura (Studia Fennica Folkloristica, 1), pp. 225–31.

Voutilainen, E. (1956). Kalkkikaivos. Online photograph collection of Finnish Heritage Agency. https://museovirasto.finna.fi/Record/museovirasto.CB110B126DCB0814591ADC03C07893A2

Widdup, H. (2018, June). Opinion: Exploration activity is increasing, and with it greed and speculation. AusimmBulletin online article. www.ausimmbulletin.com/opinion/exploration-activity-increasing-greedspeculation/

Wiegink, N. (2018). Imagining booms and busts: Conflicting temporalities and the extraction "development" nexus in Mozambique. *The Extractive Industries and Society*, 5 (2), 245–252. https://doi.org/10.1016/j.exis.2018.02.012

Williams, R. (1990). *Notes on the Underground: An Essay on Technology, Society and the Imagination*. Cambridge MA: MIT Press. Witext. (2018). LKAB mine. Wikimedia Commons online photograph. https://commons.wikimedia.org/wiki/File:LKAB_mine.jpg

Wright, S. (2012). Emotional geographies of development. *Third World Quarterly* 33(6), 1113–1127. https://doi.org/10.1080/01436597.2012.681500

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IV

Community

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9

Remediating Mining Landscapes

ANNE-CATHRINE FLYEN, DAG AVANGO, SANDRA FISCHER, CAMILLA WINQVIST

Abandoned mines are everywhere. Around the world, thousands of them are left behind where mining has ceased. Abandoned mines are not just spots made of holes in the ground. They can be open pits of immense proportions, with waste deposits on such a scale that new landforms emerge and with associated remains of derelict buildings and disused infrastructures. Mines affect entire regions. Communities have formed around them. Abandoning a mine often means emptying a village or a town.

Leaving extraction is a process worthy of study in its own right. Still, we know comparatively little about it. We know that mining is a huge planetary activity, and every new mine is prepared for years with prospecting, planning, anticipation, investment, and building, followed by the period of production. We also know that mining in the Anthropocene is a massive, geo-anthropological and geo-social undertaking, a formidable network of mines and supply chains and financial institutions, indeed a "planetary mine" (Arboleda, 2020; Sörlin, 2023, see Chapter 1). Extractive industries massively affect geopolitics and global sustainability. They are a super emitter and – polluter. Abandoning mines is, consequently, an equally vast enterprise, albeit much less known. If the goal is sustainability, the process of re-purposing and re-orienting mining geographies should be a priority for further reflection and research. The Arctic is no exception.

Much of the impact that mines have is environmental, which is the focus of this chapter. Over the last hundred years, mining has left increasingly large-scale wounds in the landscape, with polluted soil, water, and air, and affected plant and animal life. The mining industry is one of the largest producers of industrial waste in the world. In Sweden, the sector produced between 77 percent and 82 percent of all industrial waste in the country in the period 2010–2016 (Naturvårdsverket, 2018). Large socio-technical systems for mining, not least infrastructures for transport and energy, may affect other land users negatively (Avango, 2020). Environmental impacts of mining have been at the center of a critical debate about metal demand in society and the interests of the mining industry, pitted against the goal of protecting natural

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environments (e.g., Müller, 2014). To reverse the amount of degraded land, ecosystem restoration has been acknowledged as an important and necessary activity over the last decade (Benayas et al., 2009; CBD, 2010; Comín, 2010; Bullock et al., 2011; Aasetre, Hagen, & Bye, 2021). In general rewilding, large-scale ecosystems are restored (Houlston & Shepherd, 2016), returning a landscape to the condition it was in before humans modified it. However, rewilding projects have different goals, tools, and methods depending on starting points and angles of approach (Jørgensen, 2015; Aasetre et al., 2021). This is underlined by a large and diverse body of literature dealing with adaptive reuse of brownfield sites, including political and economic issues (Hula, Reese, & Jackson-Elmoore, 2016), contamination (e.g., Hollander, Kirkwood, & Gold, 2010), social aspects (Kühne, 2019), legal issues (e.g., Guariglia, Ford, & Darosa, 2002; Thornton et al., 2007), and questions of historic preservation (e.g., Baker, Moncaster, & Al-Tabbaa, 2017).

Research in the hard sciences is of utmost importance for tackling environmental impacts from the extractive industries that are rapidly expanding the "planetary mine." In this chapter, however, we will argue that the scope of environmental remediation research should be widened beyond the confines of the engineering- and natural sciences, to encompass the humanities and social sciences. The aim of the chapter is to show that environmental remediation is not only a matter of finding effective technologies for dealing with toxic waste. The success or failure of environmental remediation of former mines can be just as much a societal issue as a technological one. The European Arctic serves in fact as an excellent lens for exploring societal dimensions of environmental remediation processes, because of relatively dense population and the wide range of societal actors and interests in the region, and the severity of the impacts.

We will home in on the social and environmental history of two restoration projects – the former mines in Nautanen in Norrbotten, Sweden, and the Lunckefjell and Sveagruva mines on Svalbard. Environmental remediation on these sites has taken shape in very different contexts. At Lunckefjell it was initiated in accordance with the environmental law for Svalbard, with a mining concession that required the complete removal of all traces of the mining past. When the mine closed in 2016 the owner – the Norwegian government – not only remediated Lunckefjell but it also decided to eradicate all remnants of a much larger mining system of which Lunckefjell was part – the Sveagruva mine. The clean-up- and transformation project was launched as one of the most ambitious environmental projects ever to happen in Norway, already selling itself as a global environmental leader (Anker, 2020). The industrial landscape was to be restored into a natural landscape, leaving only a few traces from the former industrial activity, legally protected as cultural heritage (Hagen et al., 2018) and incorporated into an existing National Park surrounding the

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site. What were the Norwegian motives? To protect the environment but also to safeguard Norwegian sovereignty at Svalbard.

The second mine, at Nautanen, was closed in 1908 after having been in operation for only a few years. At the time of closure there were no laws requiring environmental remediation of former mining sites. Nautanen was simply abandoned, although not forgotten. Unknown to most people, the remains of the mine continuously polluted the environment through the release of heavy metals into the water system. This became clear only in 1993 and triggered a number of investigations and environmental remediation efforts extending over more than two decades. Both state and corporate actors were involved. After millions in state investments and large-scale removal of waste rocks from the area, the environmental remediation of Nautanen came to a halt in 2017. The residues from mining and smelting remained, however, and still pollute the environment today.

Why did these two environmental remediation projects turn out so differently? Why has it been possible to remove every trace of former mining at the extremely remote Lunckefjell-Sveagruva location in the high Arctic (Figures 9.1 and 9.2), while it has proven impossible to do the same at the much more accessible site in Nautanen? Our answer to those questions will rest on the archives of actors who were involved, as well as from interviews and industrial-archaeological fieldwork. We need to know: Who held a stake in the future of the former mines at Lunckefjell-Sveagruvan and Nautanen? What were their interests? How did they realize them and what was the outcome? By answering these questions, we will show that environmental remediation is a game set to satisfy the interests of actors competing over the future of the region. The stories we tell are also about the wider question: Who can determine the post-extraction future of Arctic mines and why?

Previous Research on Environmental Remediation

Despite a huge body of literature from different disciplines dealing with adaptive reuse of brownfield sites, a focus on potential, emerging, and ongoing mining industries is the general tendency in existing academic literature. The closure of mines and their transformation and afterlives has been less described and discussed (Hojem, 2014). Mining in the European Arctic has been going on since at least the seventeenth century, and the majority of the mining sites from this history have already been abandoned, some with significant amounts of toxic waste deposited in the environment (Avango & Rosqvist, 2021). Most of these sites do not create new detectable industrial values. Environmental historians Arn Keeling and John Sandlos have named them “zombie mines” – dead, but continuing to affect the environment with their toxic legacy (Keeling & Sandlos, 2017).

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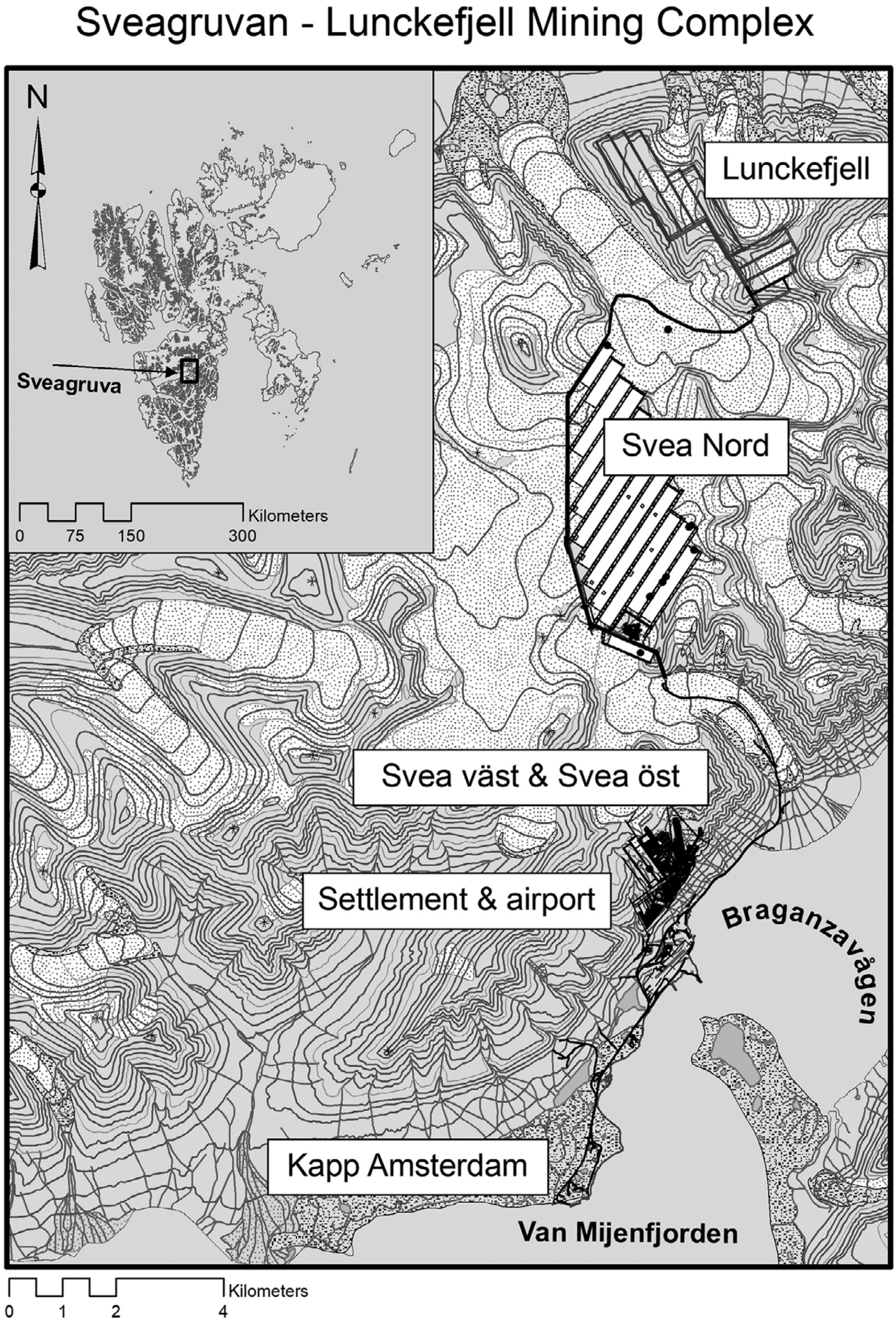

Figure 9.1 Map over the Lunckefjell-Sveagruva mining area in Svalbard. Base map: Norwegian Polar Institute and Store Norske Spitsbergen Kulkompani. Drawn by Dag Avango

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Figure 9.2 The Lunckefjell mine with its access road in August 2016. The mine and the road have since then been removed, as part of the environmental remediation. Photo by Dag Avango

Techniques for remediation of mine waste span a wide range depending on, for example, the type of polluting substance and environmental setting. For instance, acid mine drainage is formed from sulfidic mine waste exposed to air and water and is usually spread through hydrological pathways. Combustion fumes from processing the ore can also contain high levels of sulfur dioxide that later falls as atmospheric deposition and acidifies soils and freshwater systems. Depending on proximity to settlements or sensitive environments (a drinking water supply resource, nature reserve etc.) and economic capacity, the remediation strategy might differ substantially. Research on remediation strategies has included costly and monitoring-heavy active treatment (e.g., liming the water, adding chemicals) but also passive and semi-passive treatment (e.g., utilizing natural microorganisms in wetlands or bioreactors) with the goal to reduce the mobility of metals and keep them from spreading to the surrounding environment (Gong, Zhao, & Wang, 2018). Mine waste remediation in colder climates has to consider lower temperatures (i.e., substance degradation is low) and a strong seasonal variability in spreading pathways. Most passive (and more sustainable) remediation techniques for colder climates are still only at the laboratory scale, although some studies show successful metal retention even at temperatures down to 3°C (e.g., Nielsen et al., 2018).

Within landscape- and natural science, restoration and rewilding involves contributing to the restoration of an area that has been destroyed or disturbed, so

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that nature values and ecosystems can be preserved (Lammerant et al., 2013). In the past, restoration projects tried to recreate "original" nature. Recent projects instead respond to the fact that nature is dynamic, and that climate and other conditions affect the landscape. Today's focus in restoration projects is therefore restoring or facilitating ecological processes and functions enabling ecosystem services and habitats for species to remain resilient in the long term (Hagen et al., 2018). According to Díaz et al. (2019) the largest global threats to biodiversity and ecosystems are caused by anthropogenic degradation of landscapes. Presently, a substantial amount of scientific literature on restoring landscapes and nature exists (e.g., Dilly et al., 2010; Borišev et al., 2018; Díaz et al., 2019; Evju et al., 2020; Hancock et al., 2020). Also, the European Commission is currently working on a new legally binding restoration law as part of the Biodiversity Strategy for 2030 and the European Green Deal (SER Europe, 2021). Golub, Mahoney, and Harlow (2013) maintain that the emerging science of sustainability emphasizes interdisciplinary understandings and solutions of complex problems that are challenging human-ecological systems. According to Lorimer et al. (2015), rewilding projects also raise a series of political, social, and ethical concerns, conflicting with more established forms of environmental management, and requiring a rich conversation across the various disciplines of both the natural and social sciences. Restoration of industrial landscapes respecting pollution, natural, and cultural heritage aspects is nevertheless sparsely reported.

Sveagruva-Lunckefjell, Svalbard

Our first case, Sveagruva, has a long history characterized by two drivers of change – on the one hand fluctuations in the world market, and on the other changing geopolitical priorities, both triggering closures and reopenings. A British company were first to claim the area for coal mining in 1906, but it was Swedish companies, financed by the Swedish iron and steel industry, that from 1910 developed coal mining there – AB Isfjorden-Belsund. The steel industry had economic interests in Spitsbergen coal, but the company was also acting on behalf of the Swedish government to strengthen Sweden's influence on the legal status of Spitsbergen, which Sweden, Russia, Norway, the United States, and other states were negotiating at the time. During the First World War, when prices of coal ran high, Swedish investors formed a new company – AB Spetsbergens Svenska Kolfält – which constructed and started the mine and the mining town Sveagruvan in the summer of 1917. In 1921, a severe international economic recession led to sharp price drops for coal. Consequently, the owners restructured the mining company, while the Swedish state financed investments in more effective production systems. These efforts eventually failed when the mine caught

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fire in 1925. The company decided to stop mining operations, and nine years later sold it to the Norwegian company Store Norske Spitsbergen Kulkompani A/S (SNSK), in which the Norwegian State was the largest owner. SNSK wanted to buy it for geopolitical reasons – to ensure that the Swedish company would not sell it to the Soviet Union (Avango, 2005).

SNSK did not open any mining operations at the site until after the Second World War, however. Starting in 1946, the company constructed an entirely new mining town – now named Sveagruva – since the German military had leveled the old Swedish mining settlement in 1944. SNSK did not mine for long, however, closing it down again after only five years. The company started operations again in 1970, with the intent to eventually scale up production at the site. In 1987, however, after a decline in world market coal prices, they closed Sveagruva again (Avango & Brugmans, 2018).

In the late 1990s, after the Norwegian state had made it possible for SNSK to produce at a much larger scale than before, SNSK again developed plans to re-open Sveagruva. In 2001, the company opened a new coal mine they named Svea nord – the largest coal deposit operated on Svalbard to date. To enable it, the company greatly expanded the infrastructure by building a road across a glacier and a conveyor belt tunnel through an entire mountain. The company also increased the capacity of the Sveagruva settlement. The re-opening coincided with rising world market prices for coal, and when SNSK reached full production capacity at Svea nord, the company was able to make real economic profits for the first time in its history.

Building on this success, in 2013, SNSK opened yet another mine – Lunckefjell – which they connected to Sveagruva by new tunnels and a second glacier road through high alpine environments. By this time, however, world market prices for coal started to drop at a rapid pace, and in April 2016, SNSK placed mining operations on hold to avoid further economic loss. When coal prices eventually started to rise again, SNSK applied for permission to re-start the mine. By this time, however, political forces put a stop to further mining. In 2017, the Norwegian Storting decided to shut down all mining activity in Svea, and the mines were permanently closed in 2018 (Avango & Brugmans, 2018). With this a 100-year mining history ended (Figure 9.3).

With the closure of the Svea mine, Store Norske was obliged to remove all traces of modern mining operations. This was anchored in the start-up permission of the Lunckefjell mines and in the Svalbard Environmental Act. An enormous clean-up and transformation project was launched, aiming to be fulfilled in 2023. After the Norwegian government placed the Lunckefjell coal mine on hold, a two-year period followed during which the future of the Lunckefjell-Sveagruva mine was up for discussion. Different actors envisioned different futures for the former mining area.

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Figure 9.3 Svea during summertime 2019. Photo by Anne-Cathrine Flyen

Many people, typically current and former employees of SNSK, hoped that the government would decide to re-start mining at Lunckefjell and thereby save the massive investment the mining company had made in preparing it for extraction. Others ascribed additional values to the area – values that could be realized with or without re-starting the Lunckefjell mine. Actors within SNSK saw possibilities to re-use the mining settlement and infrastructure for industrial-related research, for example, developing cold climate technology for shipping and mining, and for practicing environmental cleanup operations such as oil spills on ice.

By offering the Sveagruva-Lunckefjell system to companies interested in conducting such research, SNSK would be able to generate new income. The idea of making Sveagruva-Lunckefjell into a research site was also shared by actors at the University center of Svalbard and Norsk Polarinstitutt, but they held other visions about the purpose of the research. They envisioned that Sveagruva could become a hub for geological research in an area of Svalbard that geologists tend to visit more seldom because of the distance from the university, which is located in Longyearbyen. In addition to research, Sveagruva could be used to house students and labs during field-based courses in various disciplines at the University Centre in Svalbard (Anonymous, interview by Avango in Longyearbyen, August, 2016). There was also considerable interest in Sveagruva among tourism companies active on Svalbard. Tour operators based in Longyearbyen saw the mining settlement as a potential hub for snowmobile-based groups, which could use the housing available there to stay for a couple of days, making excursions into spectacular surrounding landscapes that are difficult to access from Longyearbyen. There were also entrepreneurs who saw the possibility of opening a guest house with a restaurant at Sveagruva on a seasonal basis. All tourism companies also saw potential in the material remains from the history of Sveagruva, which they could

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use as anchor points for narrating the dramatic history of the mine to tourists (Anonymous, interview by Avango in Longyearbyen, August, 2016).

The Governor of Svalbard's department for environmental protection, tasked with cultural heritage protection of the islands, shared the tourism entrepreneurs' evaluation of the remains from mining, but from a legal perspective. According to environmental law on Svalbard, all remains from human activity that pre-date 1946 are automatically defined as cultural heritage and protected as such for posterity (Marstrander, 1999). None of these ideas for repurposing were new on Svalbard, where several former mining towns and prospecting camps had been successfully repurposed for tourism, research, and education. Despite this fact, the Norwegian government decided in 2018 to remove all traces of the Lunckefjell-Sveagruva mining system. This included remains of all mines, the entire settlement with housing and service buildings, technical service facilities, an airport, roads and conveyor belts, washing and dressing plants, and an entire export harbor facility at Kap Amsterdam. Sveagruvan-Lunckefjell was to be literally wiped out, with the exception of a few remains from the Swedish mining period and the early Norwegian period prior to 1946, which are legally protected as cultural heritage.

The Environmental Remediation of Sveagruva-Lunckefjell

The overall goal of Norway's Svalbard policy has been to maintain sovereignty. This has required Norwegian presence on the archipelago. No other industry has delivered as much Norwegian presence on Svalbard as mining over the last 100 years (Pedersen, 2016). Pedersen (2017) argues that the closure of the mines at Svalbard will mean fewer Norwegian inhabitants and ultimately lead to misperceptions about the legal status of Svalbard. Further, this may pose new foreign and security policy challenges to Norway.

The Norwegian Parliament decision to terminate the mining activity in Svea and Lunckefjell (Ministry of Trade, Industry and Fisheries, 2017) must be understood against this background but also in the context of the Svalbard Environmental Protection Act (Ministry of Climate and Environment, 2001). The act states, in §64, that when industry or other activity at Svalbard ends, the owner is responsible for removing remaining installations and infrastructure and restoring the area to its original appearance. The Ministry of Justice further specified that infrastructure and buildings should be removed. With this decision, the range of different visions on how to reuse the Sveagruva-Lunckefjell system became impossible to consider. They all ultimately depended on a functional settlement with infrastructure and buildings, which would instead be removed.

On behalf of the Ministry of Trade, Industry and Fisheries, Store Norske launched a thorough process planning the transformation of Svea. Their point of

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Figure 9.4 The deep water quay and the loading crane at Kapp Amsterdam. Photo by Anne-Cathrine Flyen

departure was clear. Unlike other closed mining sites at Svalbard, Sveagruva should be transformed into a place that as much as possible resembles the original state of the landscape, with the remains older than 1946 being the only exception. Environmental toxins were assumed to be the overarching problem in the transformation process. However, transforming the industrial landscape into nature and upholding heritage values in the remaining historic structures proved to be far more complex and intricate processes. The time schedule given by the Ministry was tight, and the planning process concerning the physical transformation started long before all decisions relating to the process were taken.

The remediation work started with the Lunckefjell mine in 2018 and has proceeded at a rapid pace since then, with the successive removal of the rest of the mines, the airport, the power plant, the deep-water quay, the mining settlement with over sixty buildings, huge industrial structures, and many kilometers of road (Figure 9.4). Tons of pulp will be removed and rearranged, while toxic spills will be removed or encapsulated. The reason why the Sveagruva-Lunckefjell mining area became subject to such a radical environmental remediation, despite the unprecedented high costs, was the need to fulfill the requirements of the Svalbard

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Environmental Act. There are, however, reasons to also consider other driving forces behind this huge and costly project – the geopolitics of mining at Svalbard.

The Norwegian government and SNSK have a history of proactively supporting Norwegian state influence that extends back to the formation of the company in 1916 and its active involvement in securing Norwegian sovereignty over Svalbard through the Treaty concerning Spitsbergen in 1920 (Mathisen, 1954; Østreng, 1971). Until the mid-1920s, the Norwegian government supported even highly unprofitable mining operations at Svalbard (Johannessen, 1996). After the Soviet Union had established several mining towns on Svalbard in the late 1920s and early 1930s, SNSK and the Norwegian state bought up mining properties from foreign companies that had seized their operations. The purpose was to ensure that Norway and Norwegian actors would control most of the lands on the archipelago and avoid increased Soviet presence on the islands (Avango & Roberts, 2017).

Sveagruva was a part of this geopolitics of mining right from the beginning, when SNSK bought the mine from Swedes to make sure that the newly formed Soviet company Trust Arktikugol would not be able to acquire it (Avango, 2005). Since the 1930s, the mines in Svea have hardly been economically sustainable, except during the recent global mining boom after the millennium. Supporting Longyearbyen, with more than 400 jobs at its peak, Svea was the most important tool for maintaining Norwegian settlement – and sovereignty. To close the mine obviously posed some security policy challenges (Pedersen, 2016). In 2016, the state bought the 218 square meters privately owned former coal mine of Hiorthhamn for 300 million Norwegian krone (35 million US Dollar) to avoid the risk that state-supported foreign actors, including China, would acquire it. Against this background, it is not far-fetched to consider the possibility that the removal of infrastructure and buildings would dramatically increase the cost for a company from China or Russia to restart mining at Sveagruva-Lunckefjell. Moreover, the Norwegian authorities plan to include the Sveagruva-Lunckefjell area in the Nordenskjöld land national park after the environmental remediation is finalized, which would make it very difficult to gain a concession for mining there.

Nautanen, Norrbotten

The Nautanen copper mine was established in 1902. The company, Nautanens Kopparfält AB, established it in order to profit from an increasing demand for copper, driven by industrialization in general and electrification, in particular. Another context working in favor of the mine was the expanding large-scale sociotechnical system for mining in the Swedish Arctic, built for mining iron ore at Malmberget and Kiruna. The company connected its copper mines and settlement

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to this system through an aerial ropeway, connecting the mine with the railway system at Koskuskulle (Avango & Rosqvist, 2021).

Nautanen became short-lived. In 1908, the company shut it down. During its six years of operation, the company had mined 72,000 tons of ore, or 2,000 tons of copper. After closing their mines and clearing the settlement of its more than 400 inhabitants, the bankrupt company sold off the buildings and infrastructures (Ollikainen, 2002). With the exception of one building, the only visible traces of Nautanen were the remains of house foundations, roads, mines, waste rock piles, tailings, and metallurgical slags. The latter contained sulfidic materials and were spread out across the landscape around the former processing plants and mines, on the ground and in lakes (Figure 9.5).

Over much of the twentieth century, Nautanen was an abandoned mining site. In the decades following closure, former workers and their labor organizations organized excursions to the site, using it for political mobilization against the capitalist system and for social reforms. From the 1970s, the site was reinterpreted as a cultural heritage site, in the beginning an unofficial cultural heritage defined by actors in the labor movement, and from the 1990s an official cultural heritage with a basic level of protection under Swedish heritage institutions.

From 1993, Nautanen became an object for concern regarding the state of the local environment at the site. In that year the County Administrative Board of Norrbotten, Sweden's northernmost county, issued an inventory of abandoned mine waste. The inventory, performed with Luleå Technical University, found Nautanen, the second largest historical sulfide mine in Norrbotten, to have high copper concentrations in its discharging surface water (Larborn, 1993). A year later, further investigations detailed the findings (Länsstyrelsen i Norrbotten, 2002). The issue of toxic waste at Nautanen remained dormant for years. In 1999, the Swedish government implemented a new Environmental Code (Ebbesson, 2015: 52) and set aside funds for environmental remediation of polluted areas. From the early 2000s, the funding was put to use in Nautanen. The Swedish Environmental Protection Agency granted the funding to the County Administrative Board as part of its regional program for polluted areas (Doc. 1). The challenge for the environmental remediation effort was not only about determining the extent of the contamination but also the responsibility for carrying out the remediation. The County Administrative Board examined this issue in 2002, concluding that no active party could be held responsible for the pollution, since mining company Nautanen Kopparfält AB had ceased to exist (Bothniakonsult, 2002).

With funding from the environmental protection agency, Gällivare Municipality launched a comprehensive investigation at Nautanen, including waste characterization, surface and groundwater samples, lake sediment records, and biological investigations. The final report was completed in 2002 with a risk assessment

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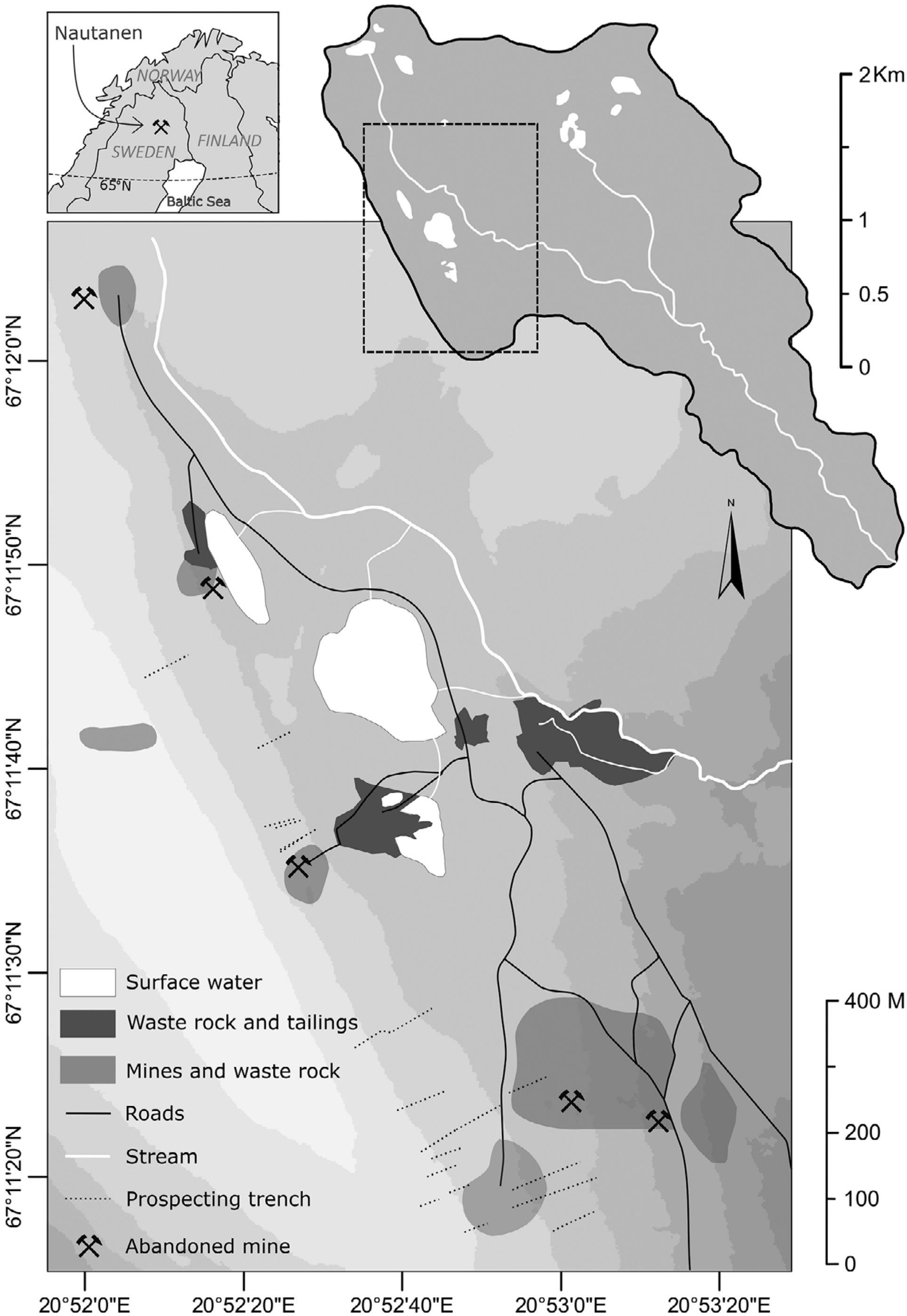

Figure 9.5 Nautanen mining area. Drawn by Sandra Fischer

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Figure 9.6 The contaminated remains of the Nautanen concentration plant and copper smelter. Photo by Dag Avango

concluding that Nautanen reached the second highest risk class (MIFO risk class 2) of contaminated sites in Sweden, posing a substantial threat to aquatic ecosystems. The metal leakage mostly originated from concentration plant sands and waste rock piles that were in contact with surface water (Figure 9.6). The report recommended remediation by assembling and covering waste, and installing technology picking up toxic substances downstream from Nautanen (Botniakonsult, 2002).

Another suggestion was to re-process some of the waste rock with the highest ore grade at the mining company Boliden's nearby copper mine Aitik and overrule the protection they had as cultural heritage. In 2005 and 2008, the company transported the waste rock by trucks and fed it into their concentration plant at Aitik, extracting copper, gold, and zinc (Botniakonsult, 2002). This project was not purely motivated by environmental considerations. Boliden had the resources and the economic incentive to do it. In 2009, the consultancy Hifab conducted an environmental impact assessment on behalf of Gällivare municipality, planning for removal of the contaminants remaining after Boliden's removal of waste rock. The main plan was to redirect water streams running through the former concentration plant and smelter area, where tailings leached out metals (Hifab, 2009). Gällivare Municipality also launched an investigation examining whether Boliden's removal

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of waste rock had any effect on water quality, which found little or no effect from this effort (Golder Associates AB, 2015).

Simultaneously with the planning for a continuation of the environmental remediation, a new challenge for the project appeared – a conflict with the landowner. The forest company Sveaskog had entered a formal agreement with the municipality back in 2006 to take on some of the remediation work, provided that the state would fund it. When the funding eventually came through, the agreement had already ceased. Now, Sveaskog no longer agreed to take responsibility for maintaining and monitoring the re-directed water streams at the site. They wanted to strictly limit their commitment to managing environmental data collecting devices and keep entrances to water tunnels free. For this reason, Gällivare municipality decided in 2014 to cancel the entire environmental remediation project at Nautanen, citing the excessive costs, and the fact that Gällivare municipality did not own the land – Sveaskog did (Doc. 2; Golder Associates AB, 2015).

In 2017, researchers from REXSAC conducted field research at Nautanen. Hydrological sampling in the area (Fischer et al., 2020) revealed that the surface water system remains highly polluted. Synthesizing the available water quality measurements at Nautanen during the previous twenty-five-year period shows that Nautanen has reached a "steady-state" in terms of metal leakage: it will likely not decrease or increase in the future but has enough waste to keep polluting the area for centuries to come.

Extracted Places with Contested Futures

Different institutional framings explain the ways the two remediation projects developed. In Sveagruva-Lunckefjell, the mining company SNSK acted in accordance with the environmental law of Svalbard, which requires companies to restore the environment to its pre-mining state. In Sweden there are similar legal requirements, but those were not in place when AB Nautanens kopparfält closed their mine in the early 1900s. Although the responsibility for remediating mining sites can be transferred to new landowners under current Swedish environmental law, the present landowner, Sveaskog, managed to avoid that by buying the forest land one day before this environmental law came into effect. Therefore, the lack of legal tools is an important part of the explanation as to why the remediation of Nautanen has failed so far, while the remediation of Sveagruva has not.

A second important difference is ownership. SNSK is still an active mining company, with a physical presence in Svalbard and a wide portfolio of economic activities in Svalbard, while AB Nautanens Kopparfält has been gone since 1908. In the Nautanen case, there is no company around to cover the costs and the hard work of remediation. The history of Arctic mining is full of similar examples, for

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example, the Giant mine in the Northwest Territories in Canada, where gold mining between 1948 and 2004 generated employment and wealth but also a toxic legacy consisting of more than 200,000 tons of arsenic. The mining company has seized to exist, leaving Canadian taxpayers to cover the costs of remediating the mining site (Sandlos & Keeling, 2016). There are similar examples from the recent history of mining in the Swedish north (Müller, 2014).

A third difference that also put the spotlight on the societal dimension of environmental remediation are the importance of interests of the actors involved for the outcome of the remediation process. In Svalbard, environmental remediation happened because a powerful actor – the Norwegian state – wanted it to happen. The state, owner of SNSK, acted in accordance with the law but also had geopolitical interests that are likely to have played a contributing role to the decision to order the complete eradication of the largest system for mining on the entire archipelago, for a price that by far exceeds any of the original estimations of the costs for remediation. It is most probable that an ambition to hinder agents of foreign powers from acquiring new land for mining in Svalbard, contributed to the willingness of the Norwegian government to act in this way, no matter the costs. In the future, when all that remains of Sveagruva-Lunckefjell are house foundations and shabby barracks protected as cultural heritage, the investment costs for starting a new mine are likely so high that it would be difficult, if not impossible, to acquire economic returns that would justify investment – at least for a company that needs to make a profit. Moreover, a company wanting to re-open mining at Sveagruva-Lunckefjell in the future would need to acquire a permit for mining in a national park. The chances that the Norwegian authorities would approve such an application seem slim.

The Norwegian policy on this matter can be interpreted in the context of Norwegian Svalbard policy over the last decade. Grydehøj et al. (2012) has pointed out that Norway's top-down governance of Svalbard through the Governor of Svalbard and by supporting unprofitable mining companies for the sake of maintaining active populated settlement has been complicated in recent years. Growing economic diversity in the wake of mine closures and a growing tourism sector has brought multinationalism and local democracy to the archipelago. At the same time a new competing power on Svalbard and in the Arctic at large has emerged beside Russia – China. The Norwegian policy on the Sveagruva-Lunckefjell environmental remediation can be interpreted as a response to this new situation. Norway's policy on climate change also contributes – large scale coal mining in a sensitive environment in the Arctic is an increasingly hard sell to voters in Norway.

In the case of Nautanen, it was the conflicting interests between the actors involved that stopped environmental remediation from happening – despite the relatively low costs involved (compared to the Svalbard case). On one side was the

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Swedish Environmental Protection Agency, the County administrative board of Norrbotten, and the Gällivare municipality, who all wanted the remediation project to happen. Their interest, and ultimately the Swedish government's, was to serve public interest and to meet policy goals for environmental protection and restoration of contaminated environments. The mining company Boliden also took responsibility for restoring the environment. Their interest was to create goodwill in a municipality where their company has large-scale mining operations running. Boliden's interest was probably also to make a profit from re-mining the waste. The company had no legal responsibility to restore the environment as a whole, and therefore took out only what they wanted and left the rest for others to take care of.

What stopped the environmental remediation project from materializing was the fact that the landowner – the state-owned forest company Sveaskog – expressed no interest in contributing to stopping the leakage of substantial amounts of heavy metals and other toxic substances from their lands into the ecosystems in their forests. The forest company had found a way to avoid taking responsibility for toxic waste on their lands and utilized it, leaving the costs for environmental remediation of their lands to an economically weak municipality with no ownership responsibility for the land at all.

Conclusions

The cases indicate that it may be difficult to predict what post-extraction histories we can expect in current and future Arctic mines, which calls for caution when planning and giving permission to extractive mega-projects. Even if it is possible to mitigate and even undo environmental damage from a technological point of view, it may be hindered by unfavorable societal contexts and actors with competing interests.

Closed mines are a challenge, not only from an environmental point of view but also from a social one. When mines are closed, settlements, towns, and regions that depended on them are in need of new income opportunities, as well as opportunities enabling the preservation of societal services and quality of life that can disappear with the mine. Social challenges post-extraction can be particularly severe in sparsely populated areas. Nautanen and Laver (Avango et al., 2023, see Chapter 10) are instructive examples. As we show elsewhere in this volume (Avango et al., 2023, see Chapter 10; Malmgren et al., 2023, see Chapter 11), de-industrialized mining settlements can gain new values that sustain them beyond the end of extraction, through new economic activities, heritage making, or by reopening mining. At Sveagruva, actors in the mining industry, tourism, and science envisioned such futures but were unable to realize them. The

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same is true in Nautanen, where local actors in Gällivare as well as official Swedish heritage protection wanted to protect remains of mining as heritage. Unfavorable institutions, the interests of powerful actors, and global economic and political trends stood in their way.

A challenge to take on for research and development on environmental remediation in the future is to find ways to harmonize needs for remediation with possibilities to create new values. In recent years, companies in the mining sector and associated research environments have worked on this issue. How can processes for mine decommissioning and rehabilitation be designed in a way that allows for the creation of new values? How can the ambitions and voices of local communities in the vicinity of the former mines be taken into account when the future of their local environments is to be determined? To consider value creation in the decommissioning process of mines, in close dialogue with affected communities, may provide tools to harmonize sustainability goals that may otherwise be in conflict.

References

Aasetre, J., Hagen, D., and Bye, K. (2021). Ecosystem restoration as a boundary object, demonstrated in a large-scale landscape restoration project in the Dovre Mountains, Norway. *AMBIO: A Journal of the Human Environment*. https://doi.org/10.1007/s13280–021-01582-2

Anker, P. (2020). *The Power of the Periphery: How Norway Became an Environmental Pioneer for the World*. Cambridge: Cambridge University Press.

Arboleda, M. (2020). *Planetary Mine: Territories of Extraction under Late Capitalism*. London & New York: Verso.

Avango, D. (2005). *Sveagruvan: Svensk gruvhantering mellan industri, diplomati och geovetenskap*. Stockholm: Jernkontoret.

Avango, D. (2020). Imprints on the Resource Landscape: The Long History of Mining in the Arctic. *Journal of Northern Studies*, 14(2), 67–81.

Avango, D. and Brugmans, P. J. (2018). *Opp og ned i 100 år: Sveagruva 1917–2017*. Longyearbyen: Svalbard Museum.

Avango, D. and Roberts, P. (2017). Heritage, conservation, and the geopolitics of Svalbard: Writing the history of Arctic environments. In L-A. Körber, S. MacKenzie, and A. Westerståhl Stenport, eds., *Arctic Environmental Modernities: From the Age of Polar Exploration to the Era of the Anthropocene*. Cham: Palgrave Macmillan, pp. 125–143.

Avango, D. and Rosqvist, G. (2021). When mines go silent: Exploring the afterlives of extraction sites. In D. Nord, ed., *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action*. Cham: Springer International Publishing, pp. 349–367.

Avango, D., Lépy, É., Brännström, M., Heikkinen, H. I., Komu, T., Pashkevich, A., and Österlin, C. (2023). Heritage for the future: Narrating abandoned mining sites. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Baker, H., Moncaster, A., and Al-Tabbaa, A. (2017). Decision-making for the demolition or adaptation of buildings. *Forensic Engineering*, 170(FE3), 144–156. http://dx.doi.org/10.1680/jfoen.16.00026

Benayas, J. M. R., Newton, A. C., Diaz, A., and Bullock, J. M. (2009). Enhancement of biodiversity and ecosystem services by ecological restoration: A meta-analysis. *Science*, 325, 1121–1124. https://doi.org/10.1126/science.1172460

Borišev, M., Pajević, S., Nikolić, N., Pilipović, A., Arsenov, D., and Župunski, M. (2018). Mine Site Restoration Using Silvicultural Approach. In M. N. V. Prasad, P. J., and de Campos Favas, S. K. Maiti, eds., *Bio-Geotechnologies for Mine Site Rehabilitation*, pp. 115–130. https://doi.org/10.1016/B978–0-12-812986-9.00007-5

Bothniakonsult. (2002). *Huvudstudierapport Nautanen*. Luleå: Bothniakonsult.

Bullock, J. M., Aronson, J., Newton, A. C., Pywell, R. F., and Rey Benayas, J. M. (2011). Restoration of ecosystem services and biodiversity: Conflicts and opportunities. *Trends in Ecology and Evolution*, 26, 541–549. https://doi.org/10.1016/j.tree.2011.06. 011

CBD, Convention on Biological Diversity. (2010). Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets "Living in Harmony with Nature". Online leaflet. www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf

Comín, F. A. (2010). The challenges of humanity in the twenty-first century and the role of ecological restoration. In F. A. Comín, ed., *Ecological Restoration: A Global Challenge*. Cambridge: Cambridge University Press, pp. 3–17.

Díaz, S., Settele, J., Brondízio, E., Ngo, H. T., Agard, J., Arneth, A., Balvanera, P., Brauman, K., Butchart, S., Chan, K., Garibaldi, L., Ichii, K., Liu, J., Subramanian, S., Midgley, G., Miloslavich, P., Molnár, Z., Obura, D., Pfaff, A., and Zayas, C. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science*, 366(6471). https://doi.org/10.1126/science.aax3100

Dilly, O., Nii-Annang, S., Schrautzer, J., Schwartze, P., Breuer, V., Pfeiffer, E .M., Gerwin, W., Schaaf, W., Freese, D., Veste, M., and Hüttl, R. F. (2010). Ecosystem manipulation and restoration on the basis of long-term conceptions. In F. Müller, C. Baessler, H. Schubert, and S. Klotz, eds., *Long-Term Ecological Research*. Dordrecht, Springer, pp. 411–428. https://doi.org/10.1007/978-90-481-8782-9_28

Ebbesson, J. (2015). *Miljörätt*. Uppsala: Iustus.

Evju, M., Hagen, D., Kyrkjeeide, M. O., and Köhler, B. (2020). Learning from scientific literature: Can indicators for measuring success be standardized in "on the ground" restoration? *Restoration Ecology*, 28(3), 519–531. https://doi.org/10.1111/rec.13149

Fischer, S., Rosqvist, G., Chalov, S. R., and Jarsjö, J. (2020). Disproportionate water quality impacts from the century-old Nautanen copper mines, *Northern Sweden, Sustainability*, 12(4), 1394. https://doi.org/10.3390/su12041394

Golder Associates AB. (2015). *Nautanen: Uppföljande miljökontroll efterbehandling av Nautanens gruvområde*. Stockholm: Golder Associates AB.

Golub, A., Mahoney, M., and Harlow, J. (2013). Sustainability and intergenerational equity: Do past injustices matter. *Sustainability Science*, 8, 269–277. https://doi.org/10.1007/s11625–013-0201-0

Gong, Y., Zhao, D., and Wang, Q. (2018). An overview of field-scale studies on remediation of soil contaminated with heavy metals and metalloids: Technical progress over the last decade. *Water Research*, 147, 440–460. https://doi.org/10.016/j.watres.2018.10.024

Grydehøj, A., Grydehøj, A., and Ackrén, M. (2012). The globalization of the Arctic: Negotiating sovereignty and building communities in Svalbard, *Norway. Island Studies Journal*, 7 (1), pp. 99–118.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Guariglia, D., Ford, M., and Darosa, G. (2002). The small business liability relief and brownfields revitalisation act: Real relief or prolonged pain? *Environmental Law Report*, 32, 10505–10511.

Hagen, D., Erikstad, L., Flyen, A. C., Hanssen, S. A., Moe, B., Lie Olsen, S., and Veiberg, V. (2018). *Avslutningsplan for Svea: Kunnskapsstatus for naturmiljø og kulturmiljø. NINA rapport 1578*. Trondheim: Norsk institutt for naturforskning.

Hancock, G. R., Martín Duque, J. F., and Willgoose, G. R. (2020). Mining rehabilitation: Using geomorphology to engineer ecologically sustainable landscapes for highly disturbed lands. *Ecological Engineering*, 155, 105836. https://doi.org/10.1016/j.ecoleng.2020.105836

Hifab. (2009). *MKB Nautanen*. Luleå: Hifab AB.

Hojem, P. (2014). *Making Mining Sustainable: Overview of Public and Private Responses*. Luleå: Luleå University of Technology.

Hollander, J., Kirkwood, N., and Gold, J. (2010). *Principles of Brownfield Regeneration: Cleanup, Design, and Reuse of Derelict Land*. Washington, DC: Island Press.

Houlston, I. and Shepherd, P. (2016). Wild times. *Landscape: The Journal of the Landscape Institute*, Spring, 9–14.

Hula, R. C., Reese, L. A., and Jackson-Elmoore, C. (eds). (2016). *Reclaiming Brownfield: A Comparative Analysis of Adaptive Reuse of Contaminated Properties*. London and New York: Routledge.

Johannessen, L. J. (1996). *Den nasjonale selvhevdelses vei: Svalbardsaken 1920 – 1925*. SMU-rapport nr 3/96. Dragvoll: Norwegian University of Science and Technology, Centre of Environment and Development.

Jørgensen, D. (2015). Ecological restoration as objective, target, and tool in international biodiversity policy. *Ecology and Society*, 20, 43. https://doi.org/10.5751/ES-08149-200443

Keeling, A. and Sandlos, J. (2017). Ghost towns and zombie mines: Historical dimensions of mine abandonment, reclamation and redevelopment in the Canadian north. In B. Martin and S. Bocking, eds., *Ice Blink: Navigating Northern Environmental History*. Calgary, Alberta: University of Calgary Press, pp. 377–420.

Kühne, O. (2019). Current issues in social science landscape research: Theoretical classifications. In O. Kühne, ed., *Landscape Theories: A Brief Introduction*. Wiesbaden: Springer VS, pp. 102–132. https://doi.org/10.1007/978-3-658-25491-9_6

Lammerant, J., Peters, R., Snethlage, M., Delbaere, B., Dickie, I., and Whiteley, G. (2013). Implementation of 2020 EU Biodiversity Strategy: Priorities for the restoration of ecosystems and their services in the EU. Report to the European Commission. Online publication. https://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/RPF.pdf

Larborn, L. (1993). *Inventering av gruvavfall i Norrbotten*. Luleå: Luleå University of Technology.

Lorimer, J., Sandom, C., Jepson, P., Doughty, C., Barua, M., and Kirby, K. J. (2015). Rewilding: Science, practice, and politics. *Annual Review of Environment and Resources*, 40, 39–62. https://doi.org/10.1146/annurey-environ-102014-021406

Länsstyrelsen i Norrbotten. (2002). *Miljöteknisk undersökning Nautanen 2001*. Luleå: Länsstyrelsen i Norrbotten & Bothniakonsult.

Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition: Arctic legacies. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

Marstrander, L. (1999). Svalbard cultural heritage management. In U. Wråkberg, ed., *The Centennial of S.A. Andrée's North Pole Expedition*. Stockholm: The Royal Swedish Academy of Sciences, pp. 119–135.
Mathisen, T. (1954). *Svalbard in International Politics 1871–1925*. Oslo: Gyldendal.
Ministry of Climate and Environment. (2001). *Svalbard Environmental Protection Act*. Act of 15 June 2001 No.79 Relating to the Protection of the Environment in Svalbard.
Ministry of Trade, Industry and Fisheries. 2017. Prop. 1 S (2017 –2018) Proposisjon til Stortinget (forslag til stortingsvedtak) Prop. 1 S (2017–2018) for budsjettåret 2018.
Müller, A. (2014). *Smutsiga miljarder: Den svenska gruvboomens baksida*. Skellefteå: Ord & visor.
Naturvårdsverket. (2018). *Avfall i Sverige 2016*. Stockholm: Naturvårdsverket.
Nielsen, G., Janin, A., Coudert, L., Blais, J. F., and Mercier, G. (2018). Performance of sulfate-reducing passive bioreactors for the removal of Cd and Zn from mine drainage in a cold climate. *Mine Water and the Environment*, 37, 42–55. https://doi.org/10.1007/s10230–017-0465-1
Ollikainen, H. (2002). *Nautanen*. Gällivare: Gellivare Sockens Hembygdsförening.
Pedersen, T. (2016). Gruvedrift og sikkerhetspolitikk. *Ottar*, 310(2), 3–9
Pedersen, T. (2017). The politics of presence: The Longyearbyen dilemma. *Arctic Review on Law and Politics*, 8, 95–108
Sandlos, J. and Keeling, A. (2016). Toxic legacies, slow violence, and environmental injustice at Giant Mine, Northwest Territories. *The Northern Review*, 42, 7–21. https://doi.org/10.22584/nr42.2016.002
SER Europe, Society for Ecological Restoration. (2021). Declaration on EU Restoration Law – SER Europe Chapter. Website. https://chapter.ser.org/europe/declaration-on-eu-restoration-law/
Sörlin, S. (2023). The extractivist paradigm: Arctic resources and the planetary mine. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press. pp. 3–31.
Thornton, G., Franz, M., Edwards, D., Phalen, G., and Nathanail, P. (2007). The challenge of sustainability: Incentives for brownfield regeneration in Europe. *Environmental Science & Policy*, 10(2), 116–134. https://doi.org/10.1016/j.envsci.2006.08.008
Østreng, W. (1971). *Økonomi og politisk suverenitet: En studie av interessespillet om Svalbards politiske status*. Unpublished Master's thesis. University of Oslo.

Archival Materials

Doc. 1: Gällivare kommun Service- och teknikförvaltningen. *Sammanträdesprotokoll 2012-06-13*. Gällivare kommun, 2012, 119–121. Gällivare municipality archives.
Doc. 2: Gällivare kommun, Ansökan, DNR 248-15743-01, 2002. Gällivare municipality archives.

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10

Heritage for the Future

Narrating Abandoned Mining Sites

DAG AVANGO, ÉLISE LÉPY[1], MALIN BRÄNNSTRÖM, HANNU I. HEIKKINEN, TERESA KOMU, ALBINA PASHKEVICH, CARL ÖSTERLIN

Introduction: Making Heritage and History

The increasing interest in mineral resources in Arctic Fennoscandia has been triggered by rising global demand and based on the prior existence of large socio-technical systems for extraction, energy, and transport. In public debates, there has been talk of a "mining boom" (Dale, Bay-Larsen, & Skorstad, 2018). Public statistics show the growth in numbers of exploration licenses and applications for mining concessions (SGU, 2012, 2018, 2020). On the ground, it is expressed in prospecting activities, test mining, and consultation meetings with land users and local communities whose future will be affected if new mining commences.

To many residents in the inland communities of the region, future visions of mining may be a promise of employment opportunities and revitalization of settlements otherwise subject to depopulation. To others it may represent a risk for local livelihoods and lifestyles, and a threat of environmental degradation. Social resistance movements, opposing mining projects, have been growing across northern Fennoscandia, organized by a variety of actors from local concerned residents and entrepreneurs to Indigenous and non-Indigenous reindeer herding communities (Mononen & Suopajärvi, 2016; Lépy et al., 2018; Beland Lindahl et al., 2018; Zachrisson et al., 2019). In the public debate, such conflicts have been pointed out as an important factor explaining what the mining industry considers to be too slow permission processes for prospecting and mining, at a time when more minerals are needed to facilitate a global transition to green energy.

A recurring feature in the discourse of competing actors in mining conflicts in the Fennoscandian Arctic is the use of narratives. These are typically about the past and of historical remains, and their purpose is to support competing visions of the future. In this chapter we analyze such practices using the concepts of history making and heritage making. The history and heritage making we analyze concern industrial society. In research and in cultural heritage practice, this field emerged in

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Britain in the 1950s and developed in the western world in the decades that followed. In Sweden, industrial heritage has increasingly become part of cultural heritage practice since the 1980s. Industrial heritage has been regarded as a tool to bring new life to de-industrializing industrial towns and to support local identity – in other words, to provide societal values out of legacies from the past (Nisser, 1996; Isacson, 2013). In this chapter we will nuance this altruistic understanding of industrial heritage by exploring how actors with competing interests use the industrial past and its remains to build the futures they desire. The aim of the chapter is to understand the role of history and heritage making in conflicts regarding new mining projects. How do competing actors in conflicts connected to mining construct heritage and narratives about history, and why? What are the outcomes of such practices?

We try to answer these questions by comparing history- and heritage making in two mining regions that have undergone de-industrialization and are subject to re-industrialization: Laver in the Pite river valley in Sweden, and Hannukainen in Kolari municipality in Finland (Figure 10.1). Laver, in Älvsbyn municipality, was a mining settlement. The Swedish mining company Boliden built and operated it between 1936 and 1946. After closure in 1946, the company dismantled the town. When global demand for metals began to surge in the early 2000s, Boliden developed plans to start a new mine at Laver on a fairly large scale. The new project has generated hope for regional economic growth as well as concern for environmental degradation and disruption of Indigenous reindeer herding (Lawrence & Kløcker Larsen, 2019).

In Kolari municipality in Arctic Finland, the mining company Rautaruukki Oy first started mining in the underground Rautuvaara mine in 1962 and then in the nearby Hannukainen open pit mine in 1978. Outokumpu Oy owned the mine until mining ceased in 1990. A concentrator plant was kept in operation until 1996 (Pelkonen 2018). At the beginning of the 2000s a European exploration and mining company, Northland Resources S.A., planned to re-open the Hannukainen open pit mine, just as in Laver but on a remarkably bigger scale. This became the subject of fierce controversy with local opponents as well as advocates of mining.

Actors on both sides in the controversies have constructed narratives about mining history and connected them with material remains in order to strengthen their positions. In this chapter we will analyze the controversies using concepts from the field of critical heritage studies. We will use the term *heritagization*, or heritage making, to describe the practice of ascribing historical values to a region, a place, and remains from the past – material and immaterial. We will pay attention to different forms of heritage making. One is official heritagization, meaning processes in which state agencies ascribe heritage values to historical remains and protect them by law. Another is unofficial, when non-state actors, often

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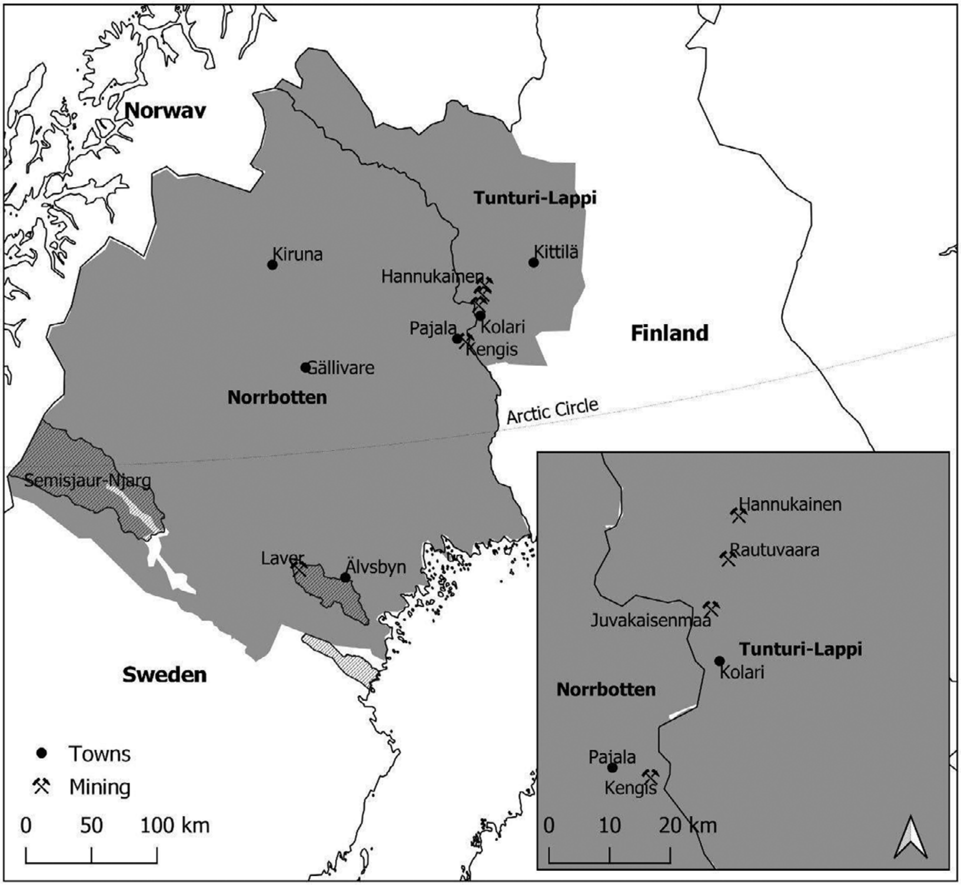

Figure 10.1 Location map of Northern Fennoscandia. Drawn by Carl Österlin

representatives of local communities, ascribe heritage values to remains and protect them by other means (Harrison, 2013; Sjöholm, 2016). A third category is corporate heritage making, when companies ascribe heritage values to their own past (Avango & Rosqvist, 2021). We will also use the concept of history making, when we can identify the wider process of establishing a particular understanding of the past, often as part of heritage making.

Laver: The Rise and Fall

The Laver area has been inhabited for thousands of years, since the inland ice retreated. The moorlands there are rich in lichen resources. For this reason, the area in and around Laver has been important for Sámi herders whose reindeer graze

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there during the winter. Archaeological remains reveal that Sámi, now organized in the Semisjaur Njarg Sámi reindeer herding community (RHC), have been part of the region for hundreds of years, and that the area has been used for small-scale farming and forestry for a very long time. Thus, the Laver area forms an important part of the cultural heritage of the Sámi people and of the historical small-scale use of resources that was carried out before industrialization.

There are several factors explaining why Boliden established the copper mine and mining settlement Laver in 1936. The first were concerns within Swedish industry and politics regarding access to metals after the First World War, which had disrupted imports of metals from abroad, causing disruption of production in several branches of industry (Vikström, 2017). To improve access to key metals necessary for Swedish industry, the Swedish state and corporate actors conducted surveys for minerals, particularly in inland areas of the north. The mining company Boliden was formed in the wake of these prospecting activities, and in 1929, Boliden surveyors found copper at Laver. In the early 1930s, the company mapped the mineralization and test mined it. The company was at first hesitant about starting up a mining operation. The size of the rich part of the mineralization was unknown and the cost of establishing a mine was high. The company leadership eventually decided to establish the mine, due to a lack of copper ore at the company's large smelter facility at Rönnskär. With larger volumes of copper ore available, Boliden would be able to extract more gold from combined gold-copper ores from its other mines in the north (Alerby, 1994).

The mine and settlement were established on a forested hillside and valley floor. The production line for mineral extraction consisted of an open pit mine and an underground mine. The above-ground production line consisted of a hoisting tower, an ore crushing plant, and a concentration plant. Beyond this complex was a large tailing pond in which the company dumped sand from the concentration plant. In other segments of the landscape the company accumulated piles of waste rock (Figure 10.2).

The settlement was built with a high standard of living in order to attract miners to move there for work. The design was commissioned to John Åkerlund, the architect who had designed Boliden's mining towns in other parts of the Swedish north. The Laver settlement consisted of buildings for housing, one to four stories high, all with central heating. It had shops, hairdressers, a community house with cinema, café and a library, a post office, dance arena, restaurant, and a fire station. When fully built the settlement consisted of thirty-one buildings out of which twenty-three were housing units, home to more than 200 inhabitants.

Mining operations at Laver became short-lived, however, due to several reasons. First, from the beginning of the 1940s the mining operations revealed that the body of relatively rich copper ore became thinner the further and deeper the mining

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Figure 10.2 The mine and the mining settlement Laver. Credit: Boliden archives.

operations advanced. For this reason, the company was unable to mine at the same speed as before. At the same time, from 1941 to 1946, the world market prices for copper decreased, particularly after the end of the Second World War. For these reasons, in 1945, the company reported a 500,000 Swedish Krona deficit and decided to close Laver the following year (Alerby, 1994).

Laver: The Afterlife

Without the mine, Boliden had no intention to maintain their settlement at Laver, and the inhabitants needed to find other jobs. The company dismantled all buildings, moving some of them to new locations. By May 1947, Boliden had finished this process. Up until today the remains from the mining past at Laver have lingered on – foundations from buildings and production facilities, as well as waste. Boliden had extracted 1,573 million tons of copper ore and generated waste rock piles as well as a dam containing 1,2 million tons of tailings, located in a valley downhill south of the former mine, covering an area of 12,2 ha. The tailing impoundment contained several toxic materials (Ljungberg & Öhlander, 2001; Alakangas, Öhlander, & Lundberg, 2010). These, as well as the former settlement, slowly fell out of attention in the years following the closure of Laver. The forces of nature continued to interact with the remains from the former mining operations.

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During the spring melting seasons in 1951 and 1952, the walls of the impoundment eroded away and as much as a quarter of the tailings (Ljungberg & Öhlander, 2001) floated out into the water system downstream. According to Alakangas et al. (2010), water running through the tailings was led into a former clarification pond. It took another twenty years before any attempts were made to deal with the toxic waste at the site. Over this period, erosion had dug deep ravines into the released waste. In 1974, bulldozers were used to smooth these out. The tailings were covered with lime and fertilizer and seeded with grass (Ljungberg & Öhlander, 2001), and a new wall was constructed three kilometers downstream from the dam that broke (Bast & Schück, 2019). Despite these efforts to contain the tailings, substantial amounts of toxic waste continued to be released annually into the waters: cadmium, copper, sulphur, and zinc (Alakangas et al., 2010). Even into the 2020s, Boliden conducts work to contain and monitor the waste in the valley south of Laver.

While the residues from the mining process at Laver have remained a challenge for Boliden and responsible state agencies, the remains of the former settlement became subject to official heritage making. This was a result of a growing interest in industrial history from the late 1960s in Sweden, in particular working-class history, and in preserving built environments of industrial society as cultural heritage. Through the 1990s and early 2000s, this interest was institutionalized when the National Heritage Board of Sweden launched programs to include industry in the sphere of heritage protection (Isacson, 2013).

In 2004, this program reached Laver, when the cultural heritage department of the Norrbotten County Administrative Board, together with Norrbotten county museum, placed signboards there. The signboards contained photos of the buildings that used to stand on the house foundations, together with texts about the history of the settlement and the buildings. The texts contained a mix of historical facts and narratives about work, everyday life, and production at Laver. The narratives were about pioneering, welfare, quality of life, and faith in the future. The phrase "*Welcome to Laver! Walk through Sweden's most modern society*" captures the nostalgia and communicates a sense of pride over a short-lived industrial wonder. The signboard text highlights how the mineworkers and their families had a strong sense of community and how Boliden provided workers with the possibility to have their own community house with the space for clubs, cinema, dance poll, coffee shop, and library. Only one signboard, located by the edge of the open pit mine, focuses on the history of the mining operations. None of the signboards narrate the history of the environmental consequences of the mine and its afterlife.

So, when Boliden re-established its interest in copper mineralization at Laver, the site was a concern for several categories of actors. On the one hand, there was

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the mining company and the environmental department of the Norrbotten County Administrative Board, who were responsible for dealing with the toxic legacies of the former mine. On the other was the cultural heritage department of the same county administrative board and the Norrbotten county museum who worked with the site and valued it as cultural heritage. Another central actor in the area was Semisjaur Njarg RHC. The Sámi reindeer herders had continued to use lands in the Laver area for winter grazing through the decades after Boliden closed. Another major land user has been the forestry companies. Since the 1950s the forests around Laver have been significantly affected by industrial logging. At the beginning of the 2000s, Pite river was pointed out as a Natura 2000 area. In the management plan it has been concluded that the environmentally harmful leakage from the old Laver mine needs to be minimized to prevent further damage to the sensitive aquatic environment (Länsstyrelsen i Norrbottens län, 2018).

Laver: The Re-birth

In addition to environmental remediation work, Boliden carried out explorations of mineral resources in the Laver area during the 1970s and the 1990s. Driven by the increasing demand for minerals, Boliden restarted exploration in 2008, and in 2014 the company submitted an application for a mining concession for Laver to the Mining Inspectorate. In their environmental impact assessment (EIA), the company described the planned mining activities and their consequences for the environment. The full extent of the proposed mining project would cover an area of approximately 46 square kilometers, including an open pit mine and all installations (Eriksson & Lindström, 2014). If the project is realized to the extent described in the application, it would become the largest mining site in Sweden and one of the largest in Europe. The main reason for this is the relatively low mineral concentration, approximately 0.21 percent, which means that relatively large amounts of ore need to be extracted, most of it ending up as waste rock and concentration plant sand. Figure 10.3 compares the extent of the old Laver mine, which closed in 1946, with the new mine Boliden applied for, which is significantly larger.

Boliden has incorporated the history of Laver to become part of the efforts to gain permission and acceptance for their new mine. In public information about the project, Boliden has described the company's long history of involvement in the area and underlined its historical record of taking social, environmental, and economic responsibilities. Boliden has described their model society with state-of-the-art housing and central heating as the most modern industrial settlement in Sweden. Boliden has also described how their dam broke in the 1950s, and how the company handled this situation (Boliden 1 and 2). The narratives convey the image of a company that took responsibility in the past and thereby can be

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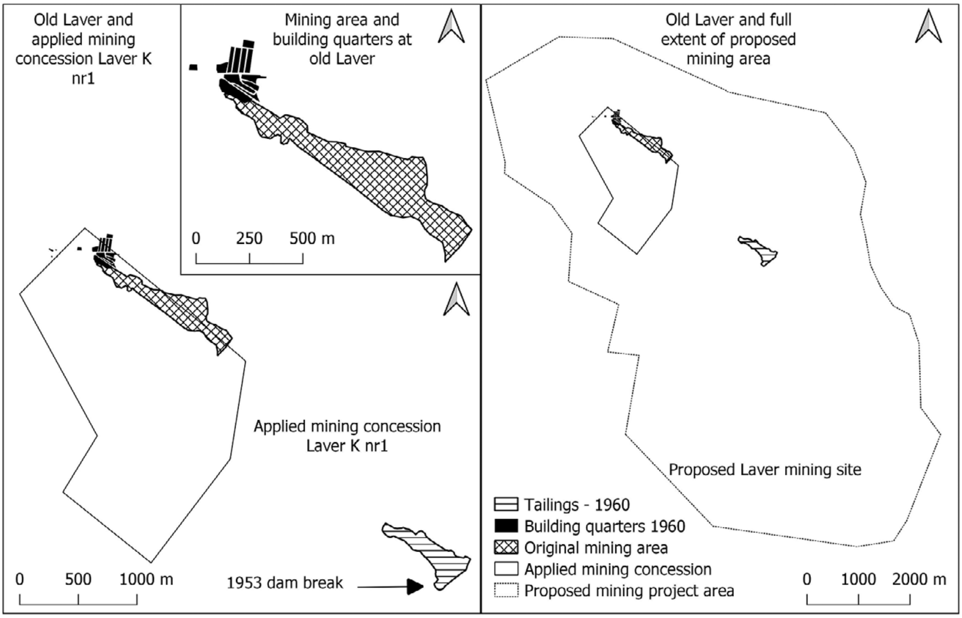

Figure 10.3 The spatial extent of the old Laver mining site, the applied mining concession Laver K nr1, and the proposed mining area realized to its full extent. Drawn by Carl Österlin

expected to do so in the future. Boliden has also declared its intention to preserve the material remains of their former mine as a cultural heritage site – a site to bring visitors to, in order to learn about the history and the future of Laver (Anonymous, interview by Pashkevich, Älvsbyn, October, 2019). This is an example of corporate heritage making, which together with Boliden's use of history is part of the company's effort to gain social acceptance and permissions for a new mine.

Besides Boliden, there are also other actors who have used the history and material remains of Laver to build support for a new mine, in particular actors within Älvsbyn municipality to whom the potential economic and social spin-offs of Boliden's project, including job promises, are values of utmost importance. To these actors, old Laver represents a period in the past when the region prospered, a period that Boliden will bring back to life, a reawakening of the phoenix. Although recognizing the environmental impacts from the historic mine, they argue that the dam break never led to any serious poisoning of the ecosystem. Instead, they place the environmental impacts of the historic mine in a narrative working in favor of the new mine, the argument being that the area has already been heavily affected by mining and forestry. In other words, the new mine will not impact any pristine environment (Anonymous, interview by Pashkevich, Älvsbyn, October, 2019).

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Municipal actors have also argued that Boliden has a history of maintaining a trustful relation with Sámi reindeer herders, which will contribute to solving land use conflicts between the reindeer herders and the mining company. Boliden's long history of presence as a mining company in the region means that the company already knows how to "treat these questions with respect and also in connection to the Indigenous issues." The continuity and good will of the company also promises a good future relation to workers and local inhabitants. To these supporters of the new mine, history holds promises for Älvsbyn to become the next "mining municipality" of Sweden (Anonymous, interview by Pashkevich, Älvsbyn, October, 2019).

The opponents of Boliden's proposed mining project, including Sámi reindeer herders and environmental groups, also relate to history and heritage. The proposed Laver mine would be located within a winter grazing area used by the family group of Tjidjack. According to Boliden's EIA, their planned mine would result in the loss of that grazing area. However, Semisjaur Njarg RHC has argued that the company has underestimated the impacts on reindeer herding, because of shortcomings in the process of developing the EIA. A community-based impact assessment, in which Semisjaur Njarg participated, concluded that the mine would have major impacts on their reindeer herding, which is why the RHC oppose Boliden's plan (Lawrence & Kløcker Larsen, 2019). In their argument against a new mine, Semisjaur Njarg has used land use history and its material representations in the landscape. They highlight how their ancestors have utilized the landscape through history, to substantiate their deep relation to the land. They also point out that there are cultural-historical remains that give evidence to longstanding Sámi use of the area, such as old huts and dwelling hearths, and emphasize how these remains remind today's reindeer herders in Laver that their family and relatives "have been here for hundreds of years." In other words, to the reindeer herders, they have a heritage in this area that should be preserved and managed for the benefit of future generations. This is an example of an unofficial heritage making, providing building blocks of a longer and substantially different narrative about the past, an understanding of the region's history that is hard to harmonize with a future in which these lands would become one of the largest industry areas in Sweden. It should be noted that the material remains that the RHC refer to are also an official heritage site, defined as remains of Sámi land use by heritage expertise and protected by Swedish heritage legislation.

Semisjaur Njarg's line of reasoning is an example of a broader use of historic arguments by RHCs in ongoing debates in Sweden concerning Sámi land rights. It relates to the historical land use of Indigenous peoples. The Swedish Supreme Court has elucidated that Sámi land rights are based on the long-time use of land, and that these rights therefore should be protected as property rights within the

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Swedish legal system (Swedish Supreme Court, 1981, 2011, 2020). However, even if the character of Sámi land rights has been elucidated through case law, Sweden has regularly been criticized by international human rights institutions that the Sámi people have too little influence over the issues directly involving them, and that their land rights have not been implemented adequately in the Swedish legal system (CERD, 2018, 2020). The Sámi reindeer herders argue that their long-time use of land needs to be accepted and implemented in the Mineral Act and other legislation. Thus, history and cultural heritage, as described by Semisjaur Njarg in the Laver case, are also central aspects of this ongoing debate about Sámi land rights in Sweden (Allard & Brännström, 2021).

In addition to the RHC, there is a growing movement in Älvsbyn municipality engaging in ongoing discussions regarding the future of mining in Laver. *Pite Älvräddare* (in English: Saviors of Pite river) is an organization that is part of the national NGO "Swedish Society for Nature Conservation." The group was formed in 2015 in response to Boliden's mining plans. As they are concerned about potential environmental risks, they have worked to build opposition to the new mine, also by history and heritage making. To the River saviors, Boliden's efforts to deal with the environmental impacts of their historic mine, that is, the tailings outwash from the 1950s, is an act of "greenwashing," meant to pave the way for gaining the necessary permits for their new mine. They argue that the environmental impacts from the historic mine provide evidence that the new mining operations could have catastrophic consequences for water quality, not only for the surrounding territory of the mine, but for the whole Pite river basin downstream from the mine, including drinking water for the town of Piteå with a population of more than 40,000 inhabitants (Anonymous, interview by Avango, Pashkevich & Rosqvist, Älvsbyn, October, 2019). The risk, they argue, will increase with climate change-induced increase of precipitation, which could force a release of toxic water from the tailings of a future mine.

The group also brings local and regional politicians to the historical remains of the old Laver mining area, along with groups of allied environmentalists, to show material evidence of negative environmental impacts of mining operations. To them, the historical remains of Laver prove that even after almost seventy years, the consequences of mining remain and will remain for many centuries to come. Their strategy can be seen as another example of unofficial heritage making, serving as a resource for building counternarratives about the relation between past and future mining. Interestingly enough, the river saviors do not focus their visits on the remains of the mining settlement, but instead on the remains of the tailing dams that collapsed in the 1950s (Anonymous, interview by Avango, Pashkevich & Rosqvist, Älvsbyn, October, 2019). In other words, they utilize another part of the story of the industrial past and a different material representation of that

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history – a history and heritage that official and corporate heritage makers have chosen to leave undercommunicated.

Hannukainen: The Rise and Fall of Mining

Kolari municipality is in the Swedish-Finnish cross border region at the Torne River Valley. This region formed a historically and culturally uniform area belonging to the Kingdom of Sweden until the formation of the Grand Duchy of Finland, an autonomous part of the Russian Empire in 1809. Due to this, Finland shares its early mining history with Sweden. Quarrying of iron ore began in Finnish Lapland in 1662 with the exploitation of Juvakaisenmaa along the river Niessajoki in the current municipality of Kolari. Here, small-scale mining continued sporadically until 1917, the same year Finland declared independence. The ore was processed mostly in the ironworks of Kengis (Köngäs) in the current municipality of Pajala in Sweden. Kengis operated until 1879 (Puustinen, 2003; Finnish Heritage Agency, 2021; GTK Finland, 2021). Furthermore, the Kolari area provided charcoal for Kengis (Kerola et al., 2010). The burning of coal is depicted on the current coat of arms of Kolari, recalling the municipality's long history of mining.

In the second half of the twentieth century, more deposits of iron were discovered in Kolari, and a new mining era began in Finnish Lapland. The most notable mining development was the ironworks and underground mine of Rautuvaara (1962–1988), as well as a concentrator plant for the nearby Hannukainen open pit mine (1978–1990). Both mines were operated by a state-led mining company, Rautaruukki Oy. Mining had considerable local economic, social, and environmental impacts in Kolari. Both mines had an important role for local employment by generating 250 well-paid jobs (Alajärvi et al., 1990) with at most 143 workers in 1976 (Figure 10.4). In addition, a wide road and the northernmost train station in Finland was built with a railroad connection to Kolari and finally to Rautuvaara ironworks in 1973 (Alajärvi et al., 1990). The nearby Äkäslompolo village in Kolari, near the mining area, got its first streetlights.

The time when the mines operated was described by locals as a time of prosperity, especially for the municipal center of Kolari (Komu, 2019). The mining company offered housing, public services, and arranged social activities (Alajärvi et al., 1990), as was the custom at the time among big industrial companies in Finland (Hentilä & Lindborg, 2009). Most of the local people working in the Hannukainen and Rautuvaara mines were from the southern part of the municipality, even though the mines were in its northern part. While the northern villages could attract tourists with their fells, the southern villages were left with hard work in forestry and agriculture, hardly ideal for their northern climate, which could explain why the mine attracted workers mainly from the south (Komu, 2019). By 1990, both mines were

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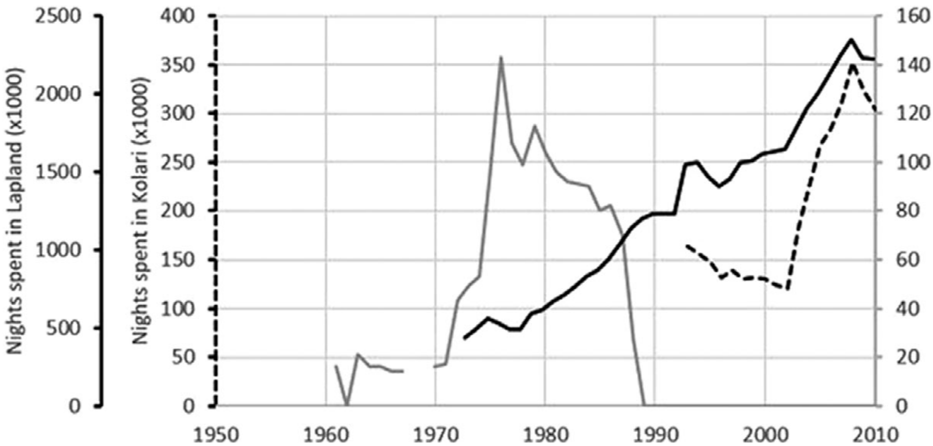

Figure 10.4 Number of workers in Rautuvaara (from 1961) and Hannukainen (from 1978) mining sites and number of nights spent in accommodation facilities (excluding camping sites) in the province of Lapland and the municipality of Kolari. Tourism in Kolari began before 1993 but data was published only from 1993. (Sources: Vuorimiesyhdistys, 1961–2003; Statistics Finland, 1973–2010)

closed due to poor profitability, even though the Rautuvaara mine had received financial support from the Finnish state. To object to the closing of the mine, a petition with over 5,000 names was collected in Kolari (Alajärvi et al., 1990). The southern part of Kolari took the hardest hit and was left with nothing to replace the loss of an income from industry. As it was described by the locals, shops were closed, apartments left empty, and people moved out.

Hannukainen: The Rise of Nature-Based Tourism

After the closing of Rautuvaara mine in 1988 and Hannukainen mine in 1990, the sites were only lightly restored. Locally, it was wondered why the company Rautaruukki Oy wanted to maintain the sites in good condition, and it was rumoured that plenty of ore was left unextracted. After closure, the open pits in Hannukainen and shafts of Rautuvaara were left to become filled with water, and both sites included waste rock storage. The Rautuvaara mining site also consists of an underground mine, tailings, a settling pond, and a reservoir (Kivinen, Vartiainen, & Kumpula, 2018). While in operation, mining activities created disturbance to reindeer herding (Bungard, 2021) and often caused the death of reindeer in train and truck accidents during the transportation of the ore to the processing facilities (Heikkinen, 2002: 181–182). According to local herders, reindeer also drowned in tailing ponds that were not fenced. However, after the

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closure of mining operations, the former mining areas remained deteriorating in the landscape, but there are speculations of potential impacts on nature from the waste rock and tailings of the Rautuvaara mine (Närhi et al., 2012; Pelkonen, 2018).

In the 1990s and early 2000s, the Hannukainen site was mostly used for small-scale gravel extraction for construction needs and the old mining infrastructure for small-scale businesses. However, the contributions to local infrastructure by the mines facilitated the growth of nature-based tourism in the northern part of the municipality, which saw the emergence of tourism activities as early as the 1930s, making it a "traditional" livelihood in its own right in the region. The first tourists arrived in the northern fell area and in the Äkäslompolo village in Kolari to enjoy local skiing. The interest of tourists for this region also grew with the creation of the Pallas-Ounastunturi National Park in 1938. The residents in northern villages slowly began to switch from agriculture, fishing, and reindeer herding to small-scale homesteads. While tourism continued to be a small business in the Kolari municipality, the first transitions to full-time tourism happened in 1966 (Niskakoski & Taskinen, 2012). From the 1980s, tourism in the area started to noticeably grow, and Äkäslompolo began its development into a tourism village, rarely found in Finland. Along with the big tourism companies, there are still many small homestays in Äkäslompolo, often run by the third generation of tourism entrepreneurs (Komu, 2019).

Nowadays, tourism is the most important and growing livelihood in Kolari (3,931 inhabitants in 2021, Statistics Finland, 2021), and the municipality's public image and economy rely heavily on nature-based tourism. As an example, 48 percent of the municipality's economy and 40 percent of employment came from tourism in 2011 (Matkailun tutkimus- ja koulutusinstituutti, 2013). Ylläs ski resort center has the fourth biggest annual revenue of all ski resorts in Finland (Jänkälä, 2019). Pallas-Yllästunturi National Park[2] is the third biggest and the most popular national park in Finland with 563,100 visitors in 2020 (Metsähallitus, n. d.). The critical starting point here is that the Hannukainen mine is located 25 kilometers northeast of the municipal center of Kolari, but only 8 kilometers from heartlands of local nature-based tourism locations and the tourism center of Ylläs and the village of Äkäslompolo.

Re-opening Hannukainen: Mobilizing the past

During the 2000s, there have been two efforts made by two different companies to begin mining in the Hannukainen site. However, both efforts are related to and were built from the arguments that refer to a continuity of local mining heritage. In 2005, the European exploration and development company Northland Resources S.A. began exploring the Kaunisvaara area in Sweden, and the Hannukainen site in

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Finland, for the purpose of re-opening the mine. However, this effort came to an end in 2014, when Northland Resources S.A. declared bankruptcy. However, in 2015, a new company titled Hannukainen mining Oy was established, and it essentially builds its rhetoric from the ground "of being local." The founder of the mother company Tapojärvi has its roots in the region in a namesake village and a lake close by. Their plans regarding Hannukainen continue to this day, even though locally there are suspicions that question the company's ability to finance and operate a mine. In addition, processing the ore and tailings at the Rautuvaara site is a part of the mining plans of Hannukainen Oy, and this sets the current "reopening" plans in another kind of historical continuum: locally feared cumulative legacies of several previous mining cycles (Närhi et al., 2012; Howett et al., 2015; Pelkonen, 2018).

Due to the impacts of the first mining period in terms of employment and other societal values, many locals consider mining as a cultural heritage: an old and valuable part of local identity and history. The traces and memories of rising living standards regarding previous mining cycles are widely recognized in the municipality, but so are the values of tourism and reindeer herding, and of nature preservation in general. In that regard, Komu (2020) stated that the dilemma is about conflicting visions of how to "pursue the good life in the North." It can be claimed that the battle is also between reclaiming, understanding, and defining which cultural heritage of the region should be prioritized and secured for local wellbeing. The question is: How can the continuity of nature-based tourism, reindeer herding, nature conservation (especially salmon spawning rivers), Sámi heritage sites (*Kirkkopahta, Pakasaivo*), and industrial development be reconciled for the future (Northland Mines Oy, 2013)?

The point of view of the Municipality administrations is clear, and they continue to be supportive of the mining plans (Sivula, 2021). In the previous municipal strategy, Kolari was characterized as a "mining and tourism municipality" (Municipality of Kolari, 2012). However, tensions between all local livelihoods, reindeer herding, tourism, and mining, have a long temporal continuum and have reflected even political leanings within the municipality. Tourism entrepreneurs feel that their livelihood never gained much respect from the southern part of the municipality or from the local government compared to the prestige given to mining. An opposition alliance against "reopening" the Hannukainen mine has been formed around the village of Äkäslompolo in recent years and especially a party of local tourism entrepreneurs and second-home owners. Finally, also Muonio Reindeer Herding Cooperative (RHC *Paliskunta*) joined the alliance, even though in previous years they had preferred to negotiate for better terms to keep up good relations with the other people trying to earn their living in the municipality (Komu, 2020). In 2017, the herding community gave a public announcement on a

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Facebook group *Pro Ylläs*, where they expressed their opposition toward the planned mine. Their public announcement stated that the land use planning decisions made by the local government would designate an area for mining that is currently being utilized by reindeer herding but the decision was made without negotiating with the herding community (Pro Ylläs, 2017). In addition, a petition against the project has been established that has garnered over 50,000 names (Pikkarainen, 2019), along with another Facebook group "Ylläs ilman kaivoksia" (Ylläs without mines) and a webpage "Pro Ylläs – Ylläs ilman kaivoksia" (www.proyllas.fi), and the tourism entrepreneurs took part in a fund-raising campaign to hire experts for the planning process (Similä & Jokinen, 2018).

In the discourses of both parties, one element is common: the utilization of the past to point out their respective arguments. The representatives of the Hannukainen Mining Oy emphasize that the new plan for the Hannukainen mine is located on the old and already altered industrial area. They reason that the open pit already exists as well as the tailing ponds and that the mining area will be just expanded. One of the key arguments of pro-mining people is the economic benefits for the municipality and the expected high rate of employment in the mining industry. Representatives of the mining company like to remind people how many good memories and benefits the previous mines brought to the local population. For that matter, it is interesting to see how Hannukainen Mining Oy refers to the past and to the golden era of mining, for example in their advertising brochures. There are many images and newspaper articles to demonstrate how Rautuvaara and Hannukainen mines were economically valuable for the local community (Hannukainen Mining Oy brochure).

They also advertise Hannukainen Mining Oy as part of the local heritage. In fact, even the company logo resembles the official symbol of heritage sites, that is, the looped square/Saint John's Arms (*Hannunvaakuna*) (Hannukainen Mining Oy, 2021). However, the company was established for the purpose of the Hannukainen mine, but it is a subsidiary of Tapojärvi Oy that was established in the village of Tapojärvi near Kolari. The owners of Tapojärvi Oy worked as truck drivers for Rautuvaara mine. The key argument on reconciling possibilities of tourism, reindeer herding, and mining is that they all existed side by side in the past and that they, especially tourism, will benefit from forthcoming new income opportunities due to mining. On the contrary, while the attitude toward tourism has been steadily improving, the plans to re-open the Hannukainen mine have brought back all the old juxtapositions between the north and south of the municipality.

The southern part embraces the opportunity to go back to the "good old days." They need and would benefit from the jobs and economic activity that would arrive with the mine, but the northern part would have no need nor time for mining-related activities due to their own traditional engagements, tourism and reindeer herding,

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which both rely on renewable nature: the natural heritage of the region (Komu, 2019, 2020). However, key here is that in the northern fell area people feel that they would have to bear the environmental consequences of mining, such as ruining of near-by waters and salmon spawning sites, and salmon is one of the local attractions. It is feared that the dust, noise, and lights coming from the mine would repel tourists from coming to the area. The people in tourism feel that their livelihood has never been taken as a serious part of local traditions and as a business that generates considerable revenue for the municipality. The employment in tourism is negatively compared to jobs provided by the mining industry, and the development of tourism in the area was described as a constant battle between the conflicting visions of the northern tourism entrepreneurs and the local government, whose members often came from the southern part of the municipality (Komu, 2019).

Reindeer herders have highlighted that reindeer herding has been there from time immemorial, and before herding, reindeer hunting, which can be read from the names of places that are still in use in herding, such as the reindeer work fence in *Hangasmaa*, a name that originally meant deer trap land (Heikkinen, 2002). Herders have also pointed out that the negative legacies from previous mines have already spoiled the environment and natural pastures used by reindeer, and these pastures have not yet fully recovered even from the previous mining cycles. In addition, the Rautuvaara tailing ponds are often visited by reindeer, since one major work fence system for reindeer herding is located nearby, and the new mine would severely disturb the utilizations of another traditional work fence system, the main round-up corral in *Lamumaa*. One of the key arguments of the opponents of mining is that the size and impacts of the suggested new mine are so different, and that local tourism and reindeer herding has changed as well, so the past successes in reconciling with mining are not comparative. For example, while in the past the tourists were domestic, now a large number of tourists come from abroad and are increasingly environmentally conscious. These changes are due to, for example, other cumulative environmental impacts (Österlin et al., 2023, see Chapter 5). The argument is that mining belongs to the past, and livelihoods that are based on renewable nature are the future.

Conclusion: Narrating Extracted Places with Contested Futures

There are several similarities between the two cases. Especially in the ways stakeholders with different positions on the future of mining construct and relate to the past. In both Älvsbyn and Kolari, pro- and anti-mining activists have built historical narratives to support their positions and have constructed material remains as a cultural heritage representing their versions of history and how it relates to the present and the future.

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The histories they construct differ greatly, however, and so does their choice of objects for heritagization. In both cases, the mining companies and their supporters in the local municipalities of Älvsbyn and Kolari produced historical narratives focusing on aspects of local mining history with positive connotations. In Laver, actors in favor of new mining focused on the history of the settlement, emphasizing the material values created by mining operations at the time. These narratives concern the settlement, the high quality of the housing, the high standard of living, the social cohesion and strong sense of community, and how all of that was lost when the company had to close the mine in 1946. When organizing visits to the area, the company and its allies have also taken visitors to the remains of the former settlement, narrating its history on site and presenting their plans for the future mine. In this way, they have constructed a history and heritage representing a lost utopia, serving as a point of departure for a new narrative about rebirth and a bright future to come.

In Kolari, Hannukainen Mining Oy and municipality politicians who were in favor of a new mine also constructed a historical narrative about the values produced during former mining activities. Their story was different, however, because of the differences in context. Kolari was a settlement before the mine and remained a settlement after the mine. Kolari was not abandoned like Laver but remains, with an economy based on other economic activities such as tourism. Therefore, their narrative was not about a lost utopia, but of a time when life in Kolari was good – people had jobs, a sense of security, and the municipality was bustling with activity. That narrative served as a promise of what a new mine would bring to Kolari, if permitted. Another difference is the fact that neither the mining company nor municipality representatives in Kolari seem to have actively used the remains of the former mines to support their story. Moreover, yet another difference is that at Kolari the Hannukainen Mining Oy has pitched itself as a local player, part of the community and its history, and therefore also honestly committed to its welfare in the future. Boliden has not emphasized their local connections as a company, most likely because there is no need for it. It is common knowledge, from the local level to the national level, that Boliden has been operating mining sites on the territory of the Swedish north since the 1920s. Moreover, it is the same company that operated the historic mine at Laver. Boliden has instead emphasized their local connections by describing a close and respectful relation to the Sámi reindeer herding communities that a future mining operation will affect.

Another feature visible in both the Swedish and Finnish cases is the way the companies deprioritized the environmental impacts of their mines from the historical narratives about utopia and the epoch of mining-generated welfare. This does not mean that the companies have tried to cover up this side of the story. To

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the contrary, both Boliden and Hannukainen Mining Oy have used the history of environmental impacts as part of a narrative with two major conclusions.

First, the mining companies of today have learned from the experiences of the past, are intent on not repeating them, and are equipped with new knowledge on how to minimize impacts, as well as new technology that reduces environmental risk. It's a story where learning from the mistakes of the past works as a warranty, which makes the sustainability standards of the present stand out in contrast in a positive way for the companies and their supporters. "In the past we made mistakes, today we do it in a sustainable way." Mining companies also claim that the mining of the future will be closed systems that would never lead to the contamination of the surrounding environment.

Second, the companies and their supporters use the environmental impacts of the past to argue that their new mines will not damage any pristine environments. The historical remains from mining operations in the past represent an actual environmental starting point, an existing footprint, and the companies will establish their new mines inside of these footprints, affecting a landscape already transformed by industrial exploitation.

Another element of this narrative is that the mining companies will remedy the damage that their predecessors made to the environment. Historic waste rock and tailings will be re-processed in the new concentration plants. In this way, the new mining operations will not only reduce ongoing environmental impacts from past mining but will also make it possible to extract more metals out of the historical remains. In these cases, although the companies are relating to and using historical remains from mining, they are not in the business of heritage making. They are, however, in the business of narrative and physical representation. Old tailings and waste rocks are historical remains that the actors in favor of new mining operations want to get rid of, as they represent an understanding of mining as environmental damage. By transforming these historical remains into metal and re-depositing them in new state of the art sand deposits they also transform this understanding of mining. It is a use of history and historical remains, but it is not heritage making. It is not about preserving remains of history; it's about transforming them.

It is interesting to note that this practice of excluding the more uncomfortable elements of history from corporate heritage making has its similarity in the way the Norrbotten County Administrative Board has narrated Laver. Only one of their historic sign boards at Laver from 2004 concerns the history of mining. The rest narrate the story of the almost utopian settlement, among the house foundations remaining from the former Laver settlement. None of them contains the history of the catastrophic events from the environmental damage caused by dam breaks in 1951 and 1952.

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Those opposed to the new mining operations at Laver and Hannukainen have also produced historical narratives of past mining operations and used the material remains from those activities in their strategies to build opposition. At Laver, only the environmentalists, the River Saviours, have focused on the environmental history of Laver. While being largely non-interested in the history of the settlement and the values it created, the organization focuses on the release of toxic waste in the 1950s. Just like the mining company and its supporters, they brought actors they wanted to convince to the remains of the toxic outwash from the old Laver tailing pond. In this way, the organization has produced a history emphasizing events in the past that are easy to use as an argument for caution regarding the potential environmental impacts of a new mine, the potential release of toxic waste from eroded tailings storage, this time with biblical proportions. They connected this history to physical remains of the mining operations in Laver, providing a physical anchor point for their narrative. At Kolari, the mining opposition follows at times a similar line of argumentation, but focusing more on potential dangers, as there has not been a similar kind of major leakage of tailing ponds comparable to Laver, for example.

The opponents of mining in both cases have also emphasized the difference in size between the historic mines and the new mines the companies want to start there. At Kolari, opponents emphasize that Hannukainen Mining Oy's is planning a new mine that will be significantly larger compared to the old mine. The two Hannukainen water-filled old open pits, Laurinoja (16 ha) and Kuervaara (5 ha) (Kivinen et al., 2018), are together 21 ha, but the current plan for Hannukainen mining site will be approximately 200 ha (Hannukainen Mining Oy magazine). So, it will be a roughly ten times bigger project than the historical one. At Laver, the opposition emphasize that Boliden plans a mine that will be nothing like the old one in size. It will be, if permitted, the largest mine and industrial site in Sweden, covering an area of 46 square kilometers. At Laver, concerns about risk pertaining to toxic waste are central in the comparisons the opposition makes with mining in the past. The tailing pond break at the historic Laver mine released extraordinary amounts of heavy metals and sulphur. The risks connected to the new dam breaks jeopardize water quality and the state of the ecosystems of the Pite river. The concerns expressed by Sámi reindeer herders are not even mentioned and taken as an actual concern by local politicians and municipal officials. At Kolari mine, opponents express similar worries, which are connected with perceived risks for release of mine waste, and especially into the Natura 2000-protected Tornio-Muonio River system. In other words, both the proponents and opponents of mining are producing historical narratives, closely connected to historical remains of former mining, when arguing about the future of mining, but they draw very different conclusions.

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In this chapter we have shown that history and heritage making may be a starting point for conflicting narratives connected to the results and effects that mining operations bring to the Arctic. The most prominent of them is the promise of a better future and high incomes for Arctic mining towns in transition (Malmgren et al., 2023, see Chapter 11). Another one states that the past can also be a source of conflict, based on irreconcilable narratives connecting the past and the future, creating obstacles to a sustainable future. Both cases, and their narratives, have generated not only an infected debate over the future of the region but also tension regarding the history of modern mining operations and the heritage of the regions. In other words, industrial history and heritage are not neutral entities and do not necessarily contribute to bringing new life to de-industrialized settlements nor any shared local identities.

Notes

1 Élise Lépy's contribution to this chapter was supported by the University of Oulu & the Academy of Finland Profi4 Grant 318930 Arctic Interactions.

2 In 2005, the national park of Pallas-Ounastunturi was expanded and renamed Pallas-Yllästunturi. The national park is now twice as large as in 1938.

References

Alajärvi, A., Suikkanen, A., Viinamäki, L., and Ainonen, M. (1990). *Kaivosyhdyskunnan purkautuminen: Tutkimus Kolarin Rautuvaaran kaivoksen sulkemisesta ja yhdyskunnan uudelleen rakenteistumisesta*. Rovaniemi: University of Lapland (Lapin korkeakoulun yhteiskuntatieteellisiä julkaisuja B. Tutkimusraportteja ja selvityksiä 10).

Alakangas, L., Öhlander, B., and Lundberg, A. (2010). Estimation of temporal changes in oxidation rates of sulphides in copper mine tailings at Laver, Northern Sweden. *Science of the Total Environment*, 408, 1386–1392. https://doi.org/10.1016/j.scitotenv.2009.11.005

Alerby, E. (1994). *Laver: beskrivning av Sveriges modernaste gruvsamhälle under åren 1937–1947, med speciell tonvikt på skolan*. Älvsbyn: Älvsby tryck.

Allard, C. and Brännström. M. (2021). Girjas reindeer herding community v. Sweden: Analysing the merits of the Girjas case. *Arctic Review on Law and Politics*, 12, 56–79. https://doi.org/10.23865/arctic.v12.2678

Avango, D. and Rosqvist, G. (2021). When mines go silent: Exploring the afterlives of extraction sites. In D. C. Nord, ed., *Nordic Perspectives on the Responsible Development of the Arctic: Pathways to Action*. Cham: Springer International Publishing, pp. 349–367.

Bast, S. and Schück, F. (2019). *Laver, då som nu : En fallstudie om efterbehandlingens vikt vid planering av gruvor* (Dissertation). Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-255886

Beland Lindahl, K., Johansson, A., Zachrisson, A., and Viklund, R. (2018). Competing pathways to sustainability? Exploring conflicts over mine establishments in the Swedish mountain region. *Journal of Environmental Management*, 218, 402–415.

CERD, Committee on the Elimination of Racial Discrimination. (2018). CERD/C/SWE/CO/22-23, Concluding observations on the combined twenty-second and twenty-third periodic reports of Sweden, A/HRC/33/42/Add.3.

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CERD, Committee on the Elimination of Racial Discrimination. (2020). CERD/C/102/D/54/2013, Opinion approved by the Committee under article 14.

Dale, B., Bay-Larsen, I., and Skorstad, B., eds. (2018). *The Will to Drill: Mining in Arctic Communities*. Cham: Springer.

Eriksson, M. and Lindström, B. (2014). The salutogenic framework for well-being: Implications for public policy. In T. J. Hämäläinen and J. Michaelson, eds., *Well-Being and beyond: Broadening the Public and Policy Discourse*. Cheltenham: Edward Elgar, pp. 68–97. https://doi.org/10.4337/9781783472901.00010

Finnish Heritage Agency. (2021). *Valtakunnallisesti merkittävät rakennetut kulttuuriympäristöt RKY*. Torniojokilaakson raudanvalmistus kohteet. Museovirasto website. www.rky.fi/read/asp/r_kohde_det.aspx?KOHDE_ID=4405

GTK, Geologian tutkimuskeskus, Finland. (2021). Rautakaivokset. GTK webpage. http://weppi.gtk.fi/aineistot/kaivosteollisuus/Rautakaivokset.htm

Hannukainen mining Oy (2021). Hannukainen Mining, mining operation for 20 years. Hannukainen Mining Oy website. www.hannukainenmining.fi/en/hannukainen-mining-values/

Harrison, R. (2013). *Heritage: Critical Approaches, Heritage Studies*. Abingdon: Routledge.

Heikkinen, H. (2002). *Sopeutumisen mallit: Poronhoidon adaptaatio jälkiteolliseen toimintaympäristöön Suomen läntisellä poronhoitoalueella 1980–2000*. Helsinki: Suomalaisen kirjallisuuden seura.

Heikkinen, H. I., Lépy, É., Sarkki, S., and Komu, T. (2016). Challenges in acquiring a social licence to mine in the globalising Arctic. *Polar Record*, 52(4), 399–411. https://doi.org/10.1017/S0032247413000843

Hentilä, H-L. and Lindborg, T. (2009). Malminetsintä- ja kaivostoiminta Suomessa. In H-L. Hentilä and E. Ihatsu, eds., *KaSuKat - kasvun ja supistumisen ohjauskeinot ja elinympäristön laatu: Tapauksena pohjoisen Suomen kaivoskunnat*. Oulu: Oulun yliopisto, pp. 10–17.

Howett, P. J., Salonen V-P., Hyttinen, O., Korkka-Niemi, K., and Moreau, J. (2015). A hydrostratigraphical approach to support environmentally safe siting of a mining waste facility at Rautuvaara, Finland. *Bulletin of the Geological Society of Finland*, 87, 51–66. http://dx.doi.org/10.17741/bgsf/87.2.001

Isacson, M. (2013). Industriarvets utmaningar. Samhällsförändringar och kulturmiljövård från 1960-tal till 2010-tal. *Bebyggelsehistorisk tidskrift*, 65, 17–36. http://uu.diva-portal.org/smash/get/diva2:682236/FULLTEXT01.pdf

Jänkälä, S. (2019). Matkailun toimialaraportti. Online publication. https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161292/TEM_3_2019_Matkailun_toimialaraportti.pdf

Ljungberg, J. and Öhlander, B. (2001). The geochemical dynamics of oxidising mine tailings at Laver, northern Sweden. *Journal of Geochemical Exploration*, 74, 52–72. https://doi.org/10.1016/S0375–6742(01)00175-3

Länsstyrelsen i Norrbottens Län. (2018). *Piteälven SE0820434: Bevarandeplan Natura 2000-område*. Luleå: Länsstyrelsen i Norrbottens Län.

Kerola, P., Heiskari, J., Koskela, I., and Mansikka, H. (2010). *Lapin vuoritoiminnan historiaa vv. 1640–1820: Kaaranneksen masuuni ja Kalttitie*. Rovaniemi: Kalttitie.

Kivinen, S., Vartiainen, K., and Kumpula, T. (2018). People and post-mining environments: PPGIS mapping of landscape values, knowledge needs, and future perspectives in northern Finland. *Land*, 7(4), 151. https://doi.org/10.3390/land7040151

Komu, T. (2019). Dreams of treasures and dreams of wilderness: Engaging with the beyond-the-rational in extractive industries in northern Fennoscandia. *The Polar Journal*, 9(1), 113–132, doi:10.1080/2154896X.2019.1618556

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Komu, T. (2020). *Pursuing the Good Life in the North: Examining the Coexistence of Reindeer Herding, Extractive Industries and Nature-Based Tourism in Northern Fennoscandia*. Oulu: University of Oulu.

Lawrence, R. and Kløcker Larsen, R. (2019). *Fighting to Be Herd: Impacts of the Proposed Boliden Copper Mine in Laver, Älvsbyn, Sweden for the Semisjaur Njarg Sami Reindeer Herding Community*. Stockholm: Stockholm Environment Institute.

Lépy, É., Heikkinen, H. I., Komu, T., and Sarkki, S. (2018). Participatory meaning-making of environmental and cultural changes in reindeer herding in the northernmost border area of Sweden and Finland. *International Journal of Business and Globalisation*, 20 (2), 203–221. https://doi.org/10.1504/IJBG.2018.089868

Matkailun tutkimus- ja koulutusinstituutti. (2013). *Matkailulla maakunta menestyy: Matkailun tulo- ja työllisyysvaikutukset 12 lappilaisessa kunnassa vuonna 2011*. Rovaniemi: Lapin yliopistopaino.

Malmgren, J., Avango, D., Persson, C., Nilsson, A. E., and Rodon, T. (2023). Mining towns in transition: Arctic legacies. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Metsähallitus. (n.d.). Kansallispuistojen, valtion retkeilyalueiden ja muiden virkistyskäytöllisesti merkittävimpien Metsähallituksen hallinnoimien suojelualueiden ja retkeilykohteiden käyntimäärät vuonna 2020. Online publication. www.metsa.fi/wp-content/uploads/2021/01/Kayntimaarat_2020.pdf

Mononen, T. and Suopajärvi, L., eds. (2016). *Kaivos suomalaisessa yhteiskunnassa*. Rovaniemi: Lapland University Press.

Municipality of Kolari. (2012). Elinkeinostrategia 2012–2020: Kolarin kunta. Kolari kunta website. www.kolari.fi/media/2015_hallinto_ja_elinkeino/elinkeinoosasto/vanhat_elinkeino/elinkeinostrategia.pdf

Närhi, P., Räisänen M. L., Sutinen M-L., and Sutinen, R. (2012). Effect of tailings on wetland vegetation in Rautuvaara, a former iron–copper mining area in northern Finland. *Journal of Geochemical Exploration*, 116–117, 60–65.

Niskakoski, K. and Taskinen, K. (2012). *Äkäslompolo: The Village of Seven Fells in the Flow of Time*. Jyväskylä: Kirjakaari.

Nisser, M. (1996). Industriminnen under hundra år. *Nordisk Museologi*, 1, 73–82. https://doi.org/10.5617/nm.3704

Northland Mines Oy. (2013). Hannukaisen kaivoshanke ympäristövaikutusten arviointiselostus. Online publications. www.ymparisto.fi/fi-FI/Asiointi_luvat_ja_ymparistovaikutusten_arviointi/Ymparistovaikutusten_arviointi/YVAhankkeet/Hannukaisen_rautakaivoshanke_Kolari/Hannukaisen_rautakaivoshanke_ymparistova(24263)

Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Pelkonen, M. K. (2018). *Mobilization of Radionuclides and Trace Metals in Tailings at the Rautuvaara Mining Site*. Unpublished Master Thesis. University of Helsinki.

Pikkarainen, A. (2019). Ylläksellä kerättiin yli 50 000 nimeä kaivosta vastaan: Kärkinimenä julkkiskauppias Sampo Kaulanen. Iltalehti newspaper article. www.iltalehti.fi/kotimaa/a/c57b34fd-edf8-4773-ad31-c04c8b5446a5

Pro Ylläs. (2017). Porotalousyrittäjien tiedote koskien Hannukaisen kaivoshanketta. Facebook publication. www.facebook.com/proyllas/photos/a.1781726912148559.1073741828.1781203888815878/1792992024355381/?type=3&hc_ref=PAGES_TIMELINE

Puustinen, K. (2003). Suomen kaivosteollisuus ja mineraalisten raaka-aineiden tuotanto vuosina 1530–2001, historiallinen katsaus erityisesti tuotantolukujen valossa. GTK online publication. http://weppi.gtk.fi/aineistot/kaivosteollisuus/

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

SGU, Sveriges Geologiska Undersökning. (2012). *Bergverksstatistik 2011/Statistics of Swedish Mining Industry 2011*. Uppsala: Sveriges Geologiska Undersökning.

SGU, Sveriges Geologiska Undersökning. (2018). *Bergverksstatistik 2017/Statistics of Swedish Mining Industry 2017*. Uppsala: Sveriges Geologiska Undersökning.

SGU, Sveriges Geologiska Undersökning. (2020). *Bergverksstatistik 2019/Statistics of Swedish Mining Industry 2019*. Uppsala: Sveriges Geologiska Undersökning.

Similä, J. and Jokinen, M. (2018). Governing conflicts between mining and tourism in the Arctic. *Arctic Review on Law and Politics*, 9, 148–173. https://doi.org/10.23865/arctic.v9.1068

Sivula, M. (2021). Kolarin kunta hyväksyi kaivostoiminnan aloittamisen Hannukaisessa – kaavamuutosehdotus meni läpi valtuustossa. Yle Uutiset newspaper article. https://yle.fi/uutiset/3-11925309

Sjöholm, J. (2016). *Heritagisation, Re-Heritagisation and De-Heritagisation of Built Environments: The Urban Transformation of Kiruna, Sweden*. Luleå: Luleå University of Technology.

Statistics Finland, 1973–2010. Accommodation statistics.

Swedish Supreme Court, NJA 1981:1 The Taxed Mountains Case.

Swedish Supreme Court, 2011:109 The Nordmaling Case.

Swedish Supreme Court, 2020:3 The Girjas Case.

Vikström, H. (2017). *The Specter of Scarcity: Experiencing and Coping with Metal Shortages, 1870–2015*. Stockholm: KTH Royal Institute of Technology.

Vuorimiesyhdistys. (1961–2003). Vuoriteollisuus.

Zachrisson, A. and Beland Lindahl, K. (2019). Political opportunity and mobilization: The evolution of a Swedish mining sceptical movement. *Resources policy*, 64, 1–12. https://doi.org/10.1016/j.resourpol.2019.101477

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11

Mining Towns in Transition

Arctic Legacies

JUDIT MALMGREN, DAG AVANGO, CURT PERSSON, ANNIKA E. NILSSON, THIERRY RODON

Towns built around mining operations in the Arctic tend to be vulnerable during de-industrialization as most jobs are in a single industry. This one-sided labor market, along with substantial distances to other employers or business opportunities entails very limited access to alternative sources of income. Therefore, when a crisis hits, the challenges of sustaining former mining towns are particularly severe. Another challenge is the legacy of the mining past that the companies leave behind.

In this chapter, we use a broad definition of the concept of legacies: It will signify anything handed down from the past, material and immaterial. To define what mining legacies may consist of, we will apply a socio-technical systems perspective, incorporating all social and physical components needed for mining (Hansson, 1998; Avango et al., 2019). Thus, material legacies of mining are artefacts and structures constructed and used in mining systems, such as mines and processing plants, infrastructure for transport and energy, waste and morphologically transformed landscapes, as well as built environments for housing, services, and sociocultural activities such as sports, entertainment, culture, and religious practice. Immaterial legacies of mining can be entities such as skills, identities, and memories.

Research on the role of such legacies in post-industrial transitions has shown that they can be used for supporting the sustainability of industrial settlements beyond the end of the industries supporting them (Isacson, 2013; Orre, 2016; Kempinsky, 2017). This can take different forms. One is by *re-using* and *re-purposing* material legacies, for example, running a workshop in a former generator building or using a mining road as a tourist trail. Another is by *heritagization*, which we here define as a process in which actors define and ascribe particular and exclusive historical values to selected legacies and protect them for posterity (Harrison, 2013). Heritagization can generate new economic values but also other values, such as quality of living. Can legacies from the past also help Arctic mining towns in transition to survive?

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Under what circumstances can legacies of a mining past contribute to the long-term sustainability of Arctic mining towns subject to economic crisis and de-industrialization? To answer this question, this chapter explores different ways in which actors who own, live in, manage, and govern mining towns have dealt with such challenges. In particular, we will explore the roles that legacies of the mining past may have played.

The chapter draws on cases from two mining towns in the Arctic that are economically dependent on large socio-technical systems (Avango et al., 2019) for iron ore extraction and steelmaking – Kiruna in Sweden and Schefferville in Canada (Figures 2.2 and 2.3). Both towns were hit heavily by the economic recession in the western world from the middle of the 1970s. As the economic crisis for the industry deepened in the early 1980s, the history of large-scale mining in the iron ore deposits of the Swedish and Canadian north appeared to have come to an end. The chapter explores how different actors in those mining towns envisioned a future beyond mining, how they eventually dealt with the crisis, with what outcomes and why.

Steel and Mining Crises Hit the Arctic

The postwar decades were a golden age for industrial growth. Between 1950 and 1974, the global demand for steel products increased by an average of nearly 5 percent per year (Warren, 1985; Magnusson, 1996; Cameron et al., 2006). Settlements based on iron ore mining were established in different parts of the world while already existing ones expanded their production capacity. The economies of these settlements were predominantly related to mining, with a one-sided industrial base and labor market, and when the oil crisis of 1973 hit, the vulnerability of these became evident. Substantial parts of the energy that the companies used to power processing plants, transports, and mining came from oil. As energy prices rose, the demand for steel in turn stagnated, which eventually resulted in a steel crisis, first and foremost affecting the western world. At the same time, western steel production was further challenged when Asia became the main steel producer on the world market. Asia had both an internal market for steel and could in addition export steel products to the western world at a significantly lower price. Western iron ore export and steel production also faced competition from, for example, Africa and South America. To handle the competition, western governments and companies designed and implemented large rationalization schemes for the steel- and mining sector, often resulting in shutdowns (Warren, 1985; Eriksson, 1991; Larsson, 1993; Magnusson, 1996; Cameron et al., 2006).

For Sweden, the general economic crisis in the iron ore mining and steel sector resulted in extensive redundancies. In an attempt to save some mining and steel industries, state and corporate actors concentrated the steel production to a few places in Sweden, a pattern similar to other steel-producing countries in the western world. To save the Swedish steel industry, a comprehensive restructuring

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of the steel and mining industry was implemented, with, for example, the merger of several large steel producers (Eriksson, 1991; Magnusson, 1996). The Swedish steel industry was reduced by over 30 percent, and the crisis also led to a sharp decline in demand for iron ore.

Consequently, the mining industry too went through an extensive structural transformation. Most iron ore mines in Sweden were shut down. The mine in Kiruna was also hit hard by the crisis. In 1981, the state-owned mining company Luossavaara-Kiirunavaara AB (LKAB) was very close to bankruptcy, large parts of the employees in the Kiruna mine were laid off, and the Swedish government started to prepare a decommissioning of LKAB's mining operations there. However, the crisis averted shortly thereafter and the Kiruna mine survived (Eriksson, 1991; Myhr Jansson, 2015). The economic crisis also hit Canada, where the Schefferville mine was closed in 1983. Only the mines of the Fermont/Labrador City region maintained production (Bradbury, 1982; Thistle & Langston, 2016).

Kiruna

Kiruna, located in Norrbotten county in northernmost Sweden, is the most significant mining town in the European Arctic, with the largest underground mine for iron ore in the world – a mine that together with nearby iron ore mines produces approximately 80 percent of the iron ore in the European Union (LKAB, 2019).

The iron ore bodies in Kiruna that were found in the seventeenth century were prospected and test-mined in the eighteenth century. At this time, the Indigenous Sámi and Tornedalians[1] inhabited the area. They were mainly using the land for hunting, fishing, cattle-based agriculture, and reindeer herding. LKAB started the first permanent mining operations in Kiruna at the turn of the twentieth century, establishing the mine and the mining town. The Swedish state established a railway to facilitate transport of ore, goods, and people, connecting the mines with shipping harbors in Luleå at the Gulf of Bothnia and Narvik on the Norwegian north Atlantic coast. The mine and the railway, which were both in operation from the early years of the twentieth century, created difficulties for Kiruna's Sámi population who were using the lands for, for example, reindeer herding. The railway was drawn directly over reindeer migration routes, and the mining facilities and the town of Kiruna were built within essential reindeer migration and grazing lands (Persson, 2013; Österlin et al., 2023, see Chapter 5).

Throughout the twentieth century, LKAB expanded their mining activities in Kiruna, in particular during the decades following the Second World War. Growing infrastructure such as new roads, the expansion of residential areas, and associated increased pressure from other types of land use hampered the Sámi reindeer herders' ability to conduct traditional reindeer husbandry, as well as the Tornedalians' ability

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to fish, hunt, and use bogs to harvest hay, infringing on their traditional livelihoods (Persson, 2018). In the first two decades of mining in Kiruna, in the early twentieth century, the LKAB did not employ either Sámi or Tornedalians. It was not until after the First World War that the mining company employed the first Tornedalian workers to carry out traditional mining work (Persson, 2015), and the company did not employ Sámi until after the Second World War (Persson, 2013).

Coping with Crisis: Using the Built Past in Kiruna

The steel crisis in the late 1970s had severe consequences for Kiruna. During the period 1976–1980, the town's population decreased by nearly 5 percent, and in the period between 1980–1987, the population decrease exceeded 10 percent. It was primarily young adults who left the city due to lack of jobs, as the labor market was largely concentrated on the downscaling mining and associated businesses. Another effect of the population decline was that Kiruna now developed a large housing surplus. This brought costs for the Kiruna municipality,[2] since all empty buildings had to be kept warm in order to avoid rapid decline, which in turn led to general cuts in municipal services. The decrease in population naturally led to a decrease in tax revenues, and municipal services were further weakened. Poor services, in turn, meant that even more people left the town at the same time as the inflow of new citizens was insignificant (Eriksson, 1991; Doc. 1; Doc. 2.). Under the imminent threat that the mine in central Kiruna might have to be shut down, LKAB decided to close its mining operations in Tuolluvaara, located about 4 kilometers east of central Kiruna. Accordingly, many jobs either ceased or ran the risk of ceasing in the near future (Eriksson, 1991; Törmä, 1996). This gave rise to a diminished belief in Kiruna as a place with a prosperous future (Doc. 2).

To curb the decline in population, the municipal government worked with a variety of initiatives to create alternative employment opportunities in other industries. At the same time, the municipal government decided to reduce the housing stock to better match the decreased population. This decision was further substantiated by a measure initiated by the Swedish government, which provided financial compensation to municipalities that demolished unused housing to attain a balanced economy. Accordingly, the municipality of Kiruna formed a demolition committee led by the municipal council. The target in their plan for demolition was primarily older housing stock (Doc. 2; Hedborg, 2021).

In connection with the extensive steel crisis, the state, as owner of LKAB, worked toward cutting costs within the company. As mentioned previously, voices within the Swedish government argued in favor of completely shutting down the company's mining operations for good. The Swedish government set aside hundreds of millions of Swedish kronor (1 Euro is approx. 10 Swedish kronor) in

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anticipation of such a decision. Another cost-cutting measure was to demolish most of LKAB's housing stock. Money for a project that would, among other things, be used for demolition and remediation activities was also set aside from the Swedish government (Doc. 3).

However, LKAB's and the municipality's plans for demolishing older housing units were formed at a time when a new interest in historic buildings in the mining town grew. The interest was part of a larger ideological trend in Sweden, favoring the preservation of historic built environments. This trend was a reaction to a large-scale re-development of Swedish town centers from the 1950s through the 1970s, in which municipalities demolished over 40 percent of the oldest housing stock to make way for new, more functional housing, shopping centers, and parking garages. In the prevailing future-optimistic spirit of the times, no buildings were safe. Everything from workers' quarters, decorated wooden houses, and city center nobility palaces were inexorably demolished. This version of urban transformation began to be criticized, and counter-movements resulted in a new type of cultural policy, favoring protection of cultural heritage. A new awareness grew in broad layers of the Swedish population. The immense demolitions were strongly questioned, and cultural heritage protection was significantly strengthened (Johansson, 1997). A part of this movement was increasingly concerned with the demolition of built environments from industrial society (Isacson, 2013), with the last-minute rescue of the textile industry quarters of the south Swedish town of Norrköping in the late 1970s as an important event, paving the way for later preservation actions (Alzén, 1996).

The growing interest in preserving what remained of older Swedish town centers also reached Kiruna, where it was boosted by local developments in culture and politics. The first signal of the change was a doctoral dissertation in art history focusing on how the founders of Kiruna designed the town and its architecture (Brunnström, 1980). The dissertation, which featured a generous selection of photographs of Kiruna's historic built environments, received much attention and was printed in a popular science version, which became widespread (Brunnström, 1981). It contributed to a growing awareness among Kiruna's residents about the history of their own mining town, its buildings and landscapes, and the appreciation of it as a cultural heritage. The second development was a project led by the County Administrative Board of Norrbotten. The project aimed to preserve the oldest buildings in an area of Kiruna known as the company area (Bolagsområdet in Swedish) – buildings that LKAB had planned to demolish. The county and Kiruna municipality implemented a conservation plan for the area, and in 1986 set up a trust with the task of conducting conservation there (Kiruna municipality, 1986; Hedborg, 2021).

Another factor that worked in favor of preserving instead of demolishing was an enduring idea about Kiruna as a site of cultural significance. The founders of Kiruna supported public education, art, and other forms of culture, and as a result,

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early Kiruna had high-quality art exhibitions, open to the public. The mining company invited the best-known Swedish artists of the time to perform their art and purchased substantial quantities of artworks that are still present in public and LKAB buildings (Andrén, 1989). Together with elaborate architecture and planning, this contributed to the idea that the town itself embedded cultural values. The municipality's decision to enroll famous architect Ralph Erskine in the re-design of central Kiruna in the 1960s can be considered a continuation of this self-understanding (Egelius, 1990; Sörlin, 1993).

Triggered by this growing interest in preserving older buildings in Kiruna, local politicians formed a conservation committee, which created a plan for conservation of the oldest housing areas. There were now two different committees in the municipal administration, which worked with two opposite objectives – one for demolishing redundant housing, one for preserving built cultural heritage. The municipality bridged this contradiction by deciding to demolish the newest housing stock instead of the oldest, while providing LKAB with financial support to renovate the company's old housing stock. Funds that were meant to function as means to pay the redundant LKAB-workers during the crisis instead went to preservation work (Eriksson, 1991; Hedborg, 2021). The investments in preserving and renovating historic buildings became a successful contribution to the efforts of sustaining Kiruna through the crisis. Once renovated, the apartments became immensely popular. Kiruna residents queued for these apartments, which is a situation that prevails today. Art and cultural heritage together with a broad popular participation in social organizations became cornerstones of a humanistic way of sustaining the town of Kiruna (Hedborg, 2021).

Post-extraction Future Visions during the Mining Boom

In the early 2000s, prices for metals on global markets started to rise dramatically, driven by demand in growing economies in the global South and East Asia, China in particular. Consequently, companies launched prospecting campaigns, opened new mines, re-opened old mines, and expanded production in existing mines. This mining boom was global, but in Europe and North America it had a northern direction. The largest untapped mineralizations were located in the Arctic, and prices were high enough to guarantee profits despite high investment and operational costs (Bay-Larsen, Skorstad, & Dale, 2018).

In Kiruna, LKAB responded by deciding to open a new level in the ore body. Unlike previous decisions to open new levels, this meant that the company would have to perform the immense project of relocating the entire town because of land deformations that the underground mining operations would now cause. The expanding mining operations and the construction work in the town contributed to a diversification of the local economy, as well as a growing optimism in the town.

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Lately, this optimism has grown even further, in the wake of LKAB plans to invest in steelmaking processes emitting less greenhouse gas (Myhr Jansson, 2015; LKAB, 2020). In this way, Swedish iron would become even more attractive on the international market and thus pave the way for expanded mining, new job opportunities, and regional economic growth. Expectations of increasing demand for copper and rare earth minerals, along with efforts to increase energy production from wind power, are at the same time increasing the competition for land. As a result, conflicts over what could be considered a sustainable local future are escalating, particularly in relation to reindeer herding but also regarding the consequences of the large-scale transformation of the town because of land deformations (Österlin et al., 2023, see Chapter 5; Rosqvist et al., 2023, see Chapter 6).

The mining boom and the future visions about green steel have not entirely taken planning for a post-mining Kiruna off the agenda. Substantial price falls of iron ore in 2014 and 2015 resulted in economic losses. As prices rose again, other challenges appeared. In 2018, when planning for opening yet another level in the mine, LKAB discovered that the ore body was substantially smaller at greater depths, making mining unprofitable. Therefore, the company launched new intensive prospecting campaigns in the vicinity and eventually identified new ore bodies to extract. These events were a reminder that no ore body and no mining boom lasts forever. Clearly, LKAB is also considering this, as demonstrated by the company's recent investment plan for the environmental remediation of its mining area at Kiirunavaara (LKAB & Ecogain AB, 2019).

At a workshop in Kiruna in 2019, possible future scenarios in connection with the mine's eventual closure were discussed, which resulted in five key themes: demography, jobs, heritage, diversity, and political influence (Nilsson, 2020; Nilsson & Sarkki, 2023, see Chapter 4).

The demographic challenges concerned outmigration that would lead to an aging population and a town lacking necessary commercial and social services, where buildings would be torn down and that the new town center that is currently under construction would never develop to its potential. Making the town's economy more diverse with a focus on other businesses than those related to mining could be a possible antidote to this, according to workshop participants, and ideas of alternative jobs, where the legacies of Kiruna's mining past would be of central value, were formulated. Legacies such as skills and knowledge from mining and mining-related professions that could be used elsewhere, perhaps to remotely operate mines elsewhere in the world, or in a tourism sector that uses mining history and the built environments and landscapes it has left as a resource. Other post-extraction businesses envisioned were a continued expansion of Kiruna's space sector, mining for other resources, and automation research.

To ensure sustainable local development, Kiruna must remain an attractive place in which to live and work, and heritage could clearly contribute to this. Kiruna

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Figure 11.1 Kiruna town with its miscellaneous buildings. Photo by Curt Persson

could also become a model for sustainability, in terms of efforts to better manage the mine's impact on the environment. Workshop participants also mentioned areas in which local perspectives could be better integrated into the decision-making process.

In other words, actors in Kiruna still view the legacies from 120 years of mining operations as a resource for building a future beyond the end of extraction. The values of these legacies are multifaceted, and heritage values are only part of it. They have economic value because entrepreneurs can use them for new businesses, material legacies as well as immaterial in the form of knowledge, while municipalities can use them to create attractive settlements (Figures 11.1 and 11.2).

Schefferville

The Establishment of Schefferville The Creation of Schefferville

The iron ore deposits in the Schefferville region have been known since 1870. However, the need for steel to reconstruct Europe after the Second World War provided the incentive to, in 1949, create the Iron Ore Company of Canada (IOC), an US company created by the steel industry to open a mine in the region.

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Figure 11.2 Kirunavaara – the mountain where LKAB has been mining for over 120 years, designated as a national interest for cultural heritage preservation by the Swedish National Heritage Board, and an example of the heritage values that the mining operations have generated. Photo by Dag Avango

Before this, there was no permanent settlement in the region. In order to exploit the iron ore deposit, a railway had to be built to bring supplies for the construction of a new town and to bring the ore to the Sept-Îles port for shipping to the Midwest steel industry. The 578-kilometer railway through sparsely populated forest lands was completed in 1954, and the town of Schefferville was established the same year. A hydroelectric power station was also built to supply the town and mine. At its peak in 1976, Schefferville had more than 3,400 inhabitants (Rodon, Keeling, & Boutet, 2021).

However, the region was inhabited by two Indigenous nations, the Innu and the Naskapi, who lived in the area well before the establishment of the mine. With the opening of the mine and the establishment of Schefferville, the Innu were settled in two reserves on a piece of land surrounded by Schefferville: Lac-John established in 1960 and Matimekush established in 1968. The Innu worked at the mine, but they continued to hunt, fish, and gather on their territories since they were only employed for seasonal and unskilled jobs (Boutet, 2015).

The situation was even more complicated for the Naskapi since they were convinced in the early 1950s by federal government representatives to move from Fort Mckenzie, 300 kilometers north, to relocate in Schefferville to participate in the new mining economy. The whole Naskapi community travelled by foot to Schefferville only to find that nobody was expecting them. They had to find lodging among the Innu community until the creation of Kawawachikamach in 1981, a new village located 45 kilometers from Schefferville.[3]

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The Closure of Schefferville

In 1982, the IOC suddenly announced that the company would close the mine and the town of Schefferville. This came as a shock for the inhabitants of what had become a thriving town. IOC was planning to destroy the town, and all the inhabitants were advised to relocate to other mining towns in the region. Many workers moved with their families to Labrador City or Fermont, two mining towns located 300 kilometers south of Schefferville (Bradbury & St-Martin, 1983; Wolfe, 1992). The closure was also a shock for the Innu communities situated near Schefferville, who had no intention to leave their ancestral territory. The destruction started despite the protest of the Innu, who lived in overcrowded housing and were hoping to use the abandoned bungalows (Vakil, 1983). The Innu and the Naskapi are still resentful about the destruction of the hospital, the swimming pool, the movie theatre, the bank, restaurants and bars, churches, the bowling alley, the town gymnasium, the ski hill infrastructure, and the asphalted roads and sidewalks.

Only the hockey arena was left because the Innu mothers made a human chain around the equipment to prevent the bulldozer from destroying it (Wolfe, 1992; Boutet, 2015). In addition to the destruction of most of the town, IOC left a pervasive environmental legacy, leaving massive tailing mounts and open pits around the town. The Innu also managed to save the train by buying the equipment and the railway from IOC and now an Innu company, Tshiuetin, is running a passenger train between Sept-Îles and Schefferville. The train stops on demand along the line, allowing the Innu to access their hunting camp and thus practice their ancestral activities. The town that had 3,400 inhabitants in 1976, had only 155 in 2016, of which 40 percent are Innu (Rodon et al., 2021).

Post-extraction Future Visions during the Mining Boom

With the sharp increase of iron ore prices in the early 2000s, Schefferville has witnessed a revival of mining activity. Many new mining projects were announced, although only one mine, owned by Tata Steel, opened in 2012 near the former IOC mine. Tata Steel succeeded in keeping the mine open, despite a drop in iron prices caused by an economic slowdown in China, the same year that the mine opened. In 2016 prices started to rise again.

Due to jurisdictional issues and changes in human resource management, the new mine had minimal positive impacts on Schefferville and many negative ones. First, all the workers at the new mine are on a fly-in fly-out (FIFO) schedule, and during their shifts, they reside in a camp located at the entrance of the mine and not in Schefferville. Second, the new mine is located in Newfoundland and Labrador, while Schefferville is in Québec, even if the mine is only 20 kilometers from the

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Figure 11.3 Schefferville and Matimekush, Québec: the empty lots to the right are where the houses were destroyed. Photo by Pierre Bouchard — Simon Pilot, Copyrighted free use, https://commons.wikimedia.org/w/index.php?curid=3670850

town. This means that Tata Steel pays taxes to Labrador/Newfoundland, but since the only access to the mine is through Schefferville airport, all the workers transit through it, and since there are very few services in town, they usually drive directly to their compounds. The town has now a ghost town feel, due to the markedly reduced population. Only one restaurant and a general store serve Schefferville and Matimekush, and some sections of the town are derelict. On the other hand, Matimekush is a growing settlement, but there are few services, wide roads, and empty lots separating each house, and very few people in the streets (Figures 11.3 and 11.4). For the Innu, real-life is not in the remains of Schefferville but in the Nutshimit – the forests, lakes, and rivers surrounding the town. By contrast, Kawawachikamach, the Naskapi settlement, 45 kilometers from Schefferville, has lots of new buildings and a large school. The town resembles many other Canadian Indigenous communities. Here, mining is less present in the community space, but it is still in people's minds (Rodon et al., 2021).

Schefferville does not seem to have a thriving future. Even with the opening of the Tata Steel mine in 2011, the town has not been able to benefit much from this development. The population has failed to increase, as the mining is based on FIFO workers who only cross Schefferville on their way from the airport to

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Figure 11.4 Tata mine and Iron Ore Company pit left from earlier exploitation. Photo by Thierry Rodon

buildings located near the mine, where Tata Steel provides food and lodging. In fact, with the opening of the mine, Schefferville mainly collects iron-red dust and mud, brought in by mining trucks and workers, which is ubiquitous in town.

The two Indigenous communities of Matimekush and Kawawachikamach that now constitute most of the population in the region have a high rate of fertility, and to them, the region is not about mining but is their home, with multiple lakes and rivers, holding other values than those related to mining. The two Indigenous communities are also better able to benefit from mining since their rights are now recognized by the Canadian court and the government. Those rights might include ancestral title to the land, and this makes it impossible to open a mine without first signing an impact and benefit agreement (IBA) with the Indigenous communities concerned (Southcott et al., 2018; Rodon et al., 2021). These agreements present a form of consent, offering legal protection for the company. IBAs usually provide a share of the mine's benefit, a share of mining contracts for Indigenous contractors, and employment for Indigenous workers. Tata Steel has signed an IBA with both Matimekush and Kawawachikamach.

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This constitutes an interesting turn of fate, where the Indigenous people that were totally ignored during the early mining operation in the 1950s are now the only communities able to benefit from mining. Finally, an Innu entrepreneur has bought the Hotel Royal in Schefferville and plans to fully renovate it to be able to accommodate visitors. Matimekush has also managed to create a future by negotiating a reconciliation agreement with the mining company Rio Tinto, who have purchased IOC. This agreement is in fact an out of court settlement between the Innu communities of Matimekush and Uashat Mak Mani-Utenam that were demanding 9 billion Canadian dollars for past impacts. The agreement aims to compensate for past environmental damage left by IOC by investing in housing, roads, community equipment, and railways, the only terrestrial transport that links Matimekush to Sept-Îles and the rest of Québec. The agreement amounts to a total of 6 billion Canadian dollars (Rodon et al., 2021). The future of Schefferville is clearly in its Indigenous communities that were here before the mine.

Comparing and Concluding Discussion

The fates of Kiruna and Schefferville have differed greatly and so have the roles of legacies from the past during the dramatic transformations these towns underwent when hit by the 1970s economic crisis and the early twenty-first century mining boom.

In Kiruna, a broad societal movement aiming to stop the demolition of older buildings in Swedish towns fed into local campaigns to preserve historic built environments. This is an example of what Rodney Harrison (2013) defines as unofficial heritagization, which in this case led to official heritagization, when state and municipality provided the legal and financial means to save a historic built environment from demolition. This process made it possible to not only preserve and reuse buildings from Kiruna's history as a mining town but also to boost non-mining segments of the local economy, support local identity, and thereby contribute to the sustainability of Kiruna through this time of crisis.

In Schefferville, there was also a social movement growing to preserve the mining town after the company closed its operations. However, this movement gained momentum too late, managing to save only some of the buildings. Moreover, in Schefferville there were no state actors present as in Kiruna, with the financial means and political will to save the built environment from demolition. In other words, no official heritigization took place. Instead, the company was able to realize most of its plan – to empty the town of its workers and demolish houses.

These differences are explained by several factors. First, the most important is the difference of ownership and governance of mining settlements in Sweden and Canada, during the period analyzed in this chapter. In the Canadian Arctic, most mining towns were company towns in which the companies owned the

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infrastructure, housing, and all recreational services. The companies could do whatever they liked with their property and generally destroyed towns when closing the mine to avoid liabilities – which happened to, for example, Gagnon in 1985 (Wolfe, 1992), or Nanisivik, which was destroyed despite efforts of the local Inuit population to reclaim the housing (Bowes-Lyon, Richard, & McGee, 2009). This set-up is a result of how mining settlements have been conceived in Canada historically, operated on the assumption that the mine is a temporary operation with temporary workers (recently often as FIFO operations). Even when a town was built, as in Schefferville, the underlying assumption was that it should not survive the economic life of the mine.

In the history of the Swedish Arctic, there have also been several company towns, which companies dismantled after ending their operations. Examples are settlements built for the construction of hydro power stations, such as Messaure and Harsprånget, but also mining towns such as Laver and Nautanen (Hallin, 2003; Sundin, 2003; Avango et al., 2023, see Chapter 10). Kiruna in the context of the 1980s steel crisis, however, was governed in the same way as any town in the country at that time, as integrated parts of the Swedish state and welfare society. Even though LKAB owned – and still owns – substantial parts of the land, infrastructure, and built environments, the company did not own all of it. Just like any municipalities in Sweden, an elected municipality government governs Kiruna. The municipality oversees urban planning, which includes decisions on how to deal with historic built environments. Unlike the IOC and Tata Steel in Schefferville, the politics in Kiruna municipality include planning for the long-term future, and the future beyond mining. Conceptions inherited from the past were also at play in Kiruna at the time when the settlement was founded, here with an idea that Kiruna was there to stay, with a long-term role in large-scale industrialization of the Swedish Arctic and because the company estimated that the ore body would last forever.

The differences in ownership and governance are the most important reasons why Kiruna municipality and the Swedish state tried to develop different alternative economies during the crisis in the 1980s – including preserving historic buildings to create new economic opportunities. They were responsible for doing so. The difference in size should also be considered. Kiruna was roughly ten times the size of Schefferville in terms of population, which worked in favor of making an effort to sustain the town beyond the end of mining. In the case of Schefferville, the IOC did not have any responsibilities to maintain the town beyond the end of their mining operation and no reason to think of long-term sustainability for the town, based on heritagization, re-use of built environments, or any other activity.

Furthermore, the growth of a broad popular engagement for heritage protection in Sweden, including industrial heritage, and the progressively stronger institutionalization of heritage protection did not happen in the same way in

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Canada. Canadian legislation for urban planning contained tools for protecting heritage in the 1980s, but these institutions had no influence on company towns such as Schefferville. When the Innu residents of Schefferville wanted to bring an end to the demolition of the town after closure, there was no municipal government that could intervene and provide an alternative. The residents' only tool to protect buildings was to do it with their own bodies.

The differences between Kiruna and Schefferville must also be understood in the broader context of the two different socio-technical systems for mining. The system of which Kiruna and LKAB's mines are part is interconnected by a vast railway system transporting people and ore concentrates. It includes hydro-power stations, military infrastructures, shipping harbors at the North Atlantic, 200 kilometers west of Kiruna in Narvik, and at Luleå, 400 kilometers to the east at the Gulf of Bothnia. In Luleå, a major steel work is located, and there are several towns that, just like Kiruna, cater to the needs of those places. Since state and corporate actors built this system in the early 1900s, it has provided an opportunity for others to begin extracting other ore bodies in its vicinity, and for other economic activities such as forestry, steel manufacturing, wind energy, and tourism. The socio-technical system itself, a product of human efforts over a century, is a legacy that paved the way for diversification and the rise of new economic activities.

The system of which Schefferville was part was also made up of a railway connecting it to Sept-Îles on the Gulf of St. Lawrence. With this, however, the similarities end. The steelmaking process took place far away in the Great Lakes region of the United States, and no one established any new industries or towns along the railway line to Schefferville. Therefore, when IOC shut down their mines in Schefferville, there were no other economic actors using the system. Today, instead of primarily relating to a socio-technical system of mining that no longer provided for them, the Indigenous people who remained on their territory when the company departed returned to a mixed economy with a blend of land-based activities and mostly government transfer payment or some employment to cover the expenses of going on the land (Natcher, 2009). A precondition for such a transition was that the ecosystem was relatively intact, for example, that the mine had left no permanent toxic legacy, but also that the socio-cultural context and the knowledge of living off the land had not eroded.

Conclusions

We have shown in this chapter that the possibilities to sustain Arctic mining towns undergoing crisis, by creating new values out of legacies from the past, is dependent on several factors. First, there must be institutional frameworks providing possibilities for preserving and re-using historic built environments.

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Second, there must be a perception that legacies of closed industries can have values, either as cultural heritage or as resources for new economic activities. Third, the socio-technical systems for mining need to gain a momentum of their own.

Finally, we also conclude that both the Kiruna and Schefferville cases show the importance of local initiatives for sustaining the life of Arctic mining towns beyond the end of extraction. In both Kiruna and Schefferville, local actors envisioned ways of re-using legacies of mining for sustaining their towns and in several cases also realized those future visions. In Kiruna this entailed material legacies such as the built environment but also immaterial legacies such as know-how and perceptions of cultural values. In Schefferville, Innu entrepreneurs are re-economizing the railway system, once built for ore trains, for transporting people between coast and inland, and have re-opened the former company hotel, which brings new income, services, and diversification to their community.

Notes

1 A Swedish minority. Their mother tongue is *meänkieli*, which is close to the Finnish language and since 2000 an official national minority language in Sweden.

2 In this chapter we use, from here on, the term *municipality* for the mining town Kiruna. Municipality is a translation to English of the Swedish term *kommun*. The kommun/municipality of Kiruna is a much larger area than the mining town itself, consisting of several other settlements as well as vast sparsely populated forests, bogs, mountains, and rivers. Kiruna town, the other settlements, and these lands are governed by the Kiruna municipal government.

3 The Naskapi have signed a treaty with the Quebec and federal governments; the Northeastern Quebec Agreement (NQEA) in 1978, extinguishing their rights on their ancestral territory in exchange for financial compensation and collective property, exclusive hunting and fishing rights, and some rights on the rest of their ancestral territory. The Innu were not included in the negotiation even if part of their traditional territory is covered by the NQEA, a treaty of which they were not part (Thériault, Bourgeois, & Boiron-Fargues, 2021).

References

Alzén, A. (1996). *Fabriken som kulturarv: frågan om industrilandskapets bevarande i Norrköping 1950–1985, Linköping studies in arts and science*. Stockholm: Brutus Östlings bokförlag Symposion.

Andrén, B. (1989). *Konsten i Kiruna: patriarkalism och nationalromantik 1900–1914*. Umeå: Umeå universitet.

Avango, D., Kunnas, J., Pettersson, M. Pettersson, Ö., Roberts, P., Solbär, L., Warde, P., and Wråkberg, U. (2019). Constructing northern Fennoscandia as a mining region. In E. C. H. Keskitalo, ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. Abingdon and New York: Routledge, pp. 78–98.

Avango, D., Lépy, É., Brännström, M., Heikkinen, H. I., Komu, T., Pashkevich, A., and Österlin, C. (2023). Heritage for the future: Narrating abandoned mining sites.

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.

Bay-Larsen, I., Skorstad, B., and Dale, B. (2018). Mining and Arctic communities. In B. Dale, I. Bay-Larsen, and B. Skorstad., eds., *The Will to Drill: Mining in Arctic Communities*. Cham: Springer International Publishing, pp. 1–11.

Boutet, J. S., (2015). The revival of Québec's iron ore Industry: Perspectives on mining, development, and history. In A. Keeling and J. Sandlos, eds., *Mining and Communities in Northern Canada: History, Politics, and Memory*. Calgary: University of Calgary Press, pp. 169–206.

Bowes-Lyon, L-M., Richard, J. P., and McGee, T. M. (2009). Socio economic impacts of the Nanisivik and Polaris mines, Nunavut, Canada. In J. P. Richards, ed., *Mining, Society, and a Sustainable World*. Berlin: Springer, pp. 371–396.

Bradbury, J. H. (1982). State corporations and resource based development in Québec, Canada: 1960–1980. *Economic Geography*, 58(1), 45–61.

Bradbury, J. H. and St-Martin, I. (1983). Winding-down in a Québec mining town: A case study of Schefferville. *Canadian Geography*, 27(2), 128–144.

Brunnström, L. (1980). *Kiruna - ett samhällsbygge i sekelskiftets Sverige. Kirunas bebyggelse år för år under pionjärtiden 1890–1910*. Umeå: Umeå Universitet.

Brunnström, L. (1981). *Kiruna - ett samhällsbygge i sekelskiftets Sverige I-II*. Umeå: UTAB.

Cameron, E. R., Neal, L., Schön, L., and Sandin, G. (2006). *Världens ekonomiska historia: från urtid till nutid*. Lund: Studentlitteratur.

Egelius, M. (1990). *Ralph Erskine, architect*. Stockholm: Byggförlaget.

Eriksson, U. (1991). *Gruva och arbete: Kiirunavaara 1890–1990. Avsnitt 4 1970-1990*. Uppsala: Uppsala universitet.

Hallin, M. (2003). *Messaure - ett ödemarksbygge: en studie i hur arbetskraftsbehovet uppfylldes*. Göteborg: Göteborgs universitet, Ekonomisk-historiska institutionen.

Hansson, S. (1998). Malm, Räls Och Elektricitet. In P. Blomkvist and A. Kajser., eds., *Den Konstruerade Världen - Tekniska System I Historiskt Perspektiv*. Eslöv: Symposium, pp. 45–76.

Harrison, R. (2013). *Heritage: Critical Approaches, Heritage Studies*. New York: Routledge

Hedborg, G. (2021). interview by Curt Persson, Kiruna, former heritage custodian and county council, May 4.

Isacson, M. (2013). Industriarvets utmaningar. Samhällsförändringar och kulturmiljövård från 1960-tal till 2010-tal. *Bebyggelsehistorisk tidskrift*, 65, 17–36.

Johansson, B. O. H. (1997). *Den stora stadsomvandlingen: erfarenheter från ett kulturmord*. Stockholm: Arbetsgruppen för arkitektur och formgivning, Regeringskansliet.

Kempinsky, P. (2017). *Kulturmiljön som kraft i regionalt tillväxtarbete: erfarenheter från regeringsuppdraget att främja attraktiva kulturmiljöer i gruvsamhällen (Gruvuppdraget)*. Stockholm: Riksantikvarieämbetet.

Kiruna Municipality. (1986). *Inventeringsmaterial. Bevarandeplan. Kiruna C*. Kiruna: The building committee. https://kiruna.se/download/18.5a56c80e173056cc42e657e5/1594033219082/bevarandeplan—inventering.pdf

Larsson, M. (1993). *En svensk ekonomisk historia 1850–1985*, 2nd ed., Stockholm: Studieförbundet Näringsliv och samhälle.

LKAB, Luossavaara-Kiirunavaara Aktiebolag. (2019). *Års- och hållbarhetsredovisning*. Luleå: LKAB.

LKAB, Luossavaara-Kiirunavaara Aktiebolag. (2020). *Års- och hållbarhetsredovisning*. Luleå: LKAB.

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LKAB, Luossavaara-Kiirunavaara Aktiebolag. (2019). *Vision för ekologisk landskapsutformning av Kiirunavaara gruvindustriområde*. Umeå: Ecogain AB.
Magnusson, L. (1996). *Sveriges ekonomiska historia*. Stockholm: Tiden/Athena.
Myhr Jansson, K. (2015). *Boken om LKAB: 1890–2015*. Luleå: LKAB.
Natcher, D. C. (2009). Subsistence and the social economy of Canada's Aboriginal north. *Northern Review*, 30, 83–98.
Nilsson, A. E. (2020). *Gruvor och hållbar utveckling i norra Sverige - går det att förena?* Online report. www.rexsac.org/wp-content/uploads/2020/03/Gruvor-och-h%C3%A5llbar-utveckling-rapport-fr%C3%A5n-en-workshop-i-Kiruna-november-2019.pdf
Nilsson, A. E. and Sarkki, S. (2023). Scenarios and surprises: When change is the only given. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Orre, I. (2016). *Industriarv som tillväxtmotor: Ännu en satsning i luttrat Bergslagen*. Stockholm: Riksantikvarieämbetet.
Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Persson, C. (2013). *På disponentens tid. Hjalmar Lundbohms syn på samer och tornedalingar*. Luleå: Tornedalica.
Persson, C. (2015). *Hjalmar Lundbohm. –en studie om ledarskap inom LKAB 1898–1921*. Luleå: Luleå tekniska universitet.
Persson, C. (2018). *"Då var jag som en fånge.": statens övergrepp på tornedalingar och meänkielitalande under 1800- och 1900-talet*. Övertorneå: Svenska tornedalingars riksförbund - Tornionlaaksolaiset: Met Nuoret.
Rodon, T., Keeling A., and Boutet J. S. (2021). Schefferville revisited: The rise and fall (and rise again) of iron mining in Québec-Labrador. *Extractive Industries and Society*. https://doi.org/10.1016/j.exis.2021.101008
Rosqvist. G., Heikkinen, H. I., Suopajärvi, L., and Österlin, C. (2023). How should impacts be assessed? In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Southcott, C., Abele, F., Natcher, D., and Parlee, B., eds. (2018). *Resources and Sustainable Development in the Arctic*. London: Routledge.
Sundin, B. (2003). Vattnets kraft: forna och nära minnen av älvarnas industrialisering. In D. Avango and B. Lundström, eds., *Industrins avtryck: perspektiv på ett forskningsfält*. Eslöv: Symposion, pp 310–336.
Sörlin, S. (1993). Ett nytt land. In H. H. Brummer and L. Brunnström, eds., *Kiruna: Staden som konstverk*. Stockholm: Waldemarsudde, pp. 38–51.
Thériault, S., Bourgeois, S., and Boiron-Fargues, Z. (2021). Indigenous peoples' agency within and beyond rights in the mining context: The case of the Schefferville region. *The Extractive Industries and Society*. https://doi.org/10.1016/j.exis.2021.101008
Thistle, J. and Langston, N (2016). Entangled histories: Iron ore mining in Canada and the United States. *Extractive Industries and Society*, 3(2), 269–277.
Törmä, K. (1996). *Viscaria: historien om hur en blomma blev ett gruvföretag*. Gällivare: Viscaria AB.
Vakil, A. C. (1983). The impact of the iron ore industry on the native peoples of Schefferville, Québec, 1983, in recession, planning and socio-economic change in the Québec-Labrador iron-mining region. In J. H. Bradbury and J. Wolfe, eds., *McGill Subarctic Research Paper No. 38*. Montréal: Centre for Northern Studies and Research, pp. 131–148.
Warren, K. (1985). World steel: Change and crisis. *Geography*, 70(2), 106–117.

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Wolfe, J. (1992). Schefferville: The crisis in the Quebec-Labrador mining region. B. Mine closure in single industry towns and the problem of residual activities. In C. Neil, M. Tykkläinen, and J. Bradbury, eds., *Coping with Closure: An International Comparison of Mine Town Experiences*. London: Routledge, pp. 192–207.

Archive Materials

Doc. 1: Kiruna municipal archives. *Comparative figures Kiruna municipality. 1978–1985. Kiruna municipality's planning department.*

Doc. 2: Kiruna municipal archives. *Planning documentation. The municipal office. 1980–1990.*

Doc. 3: LKAB's archive, *Kiruna. LKAB's annual report 1980–1985.*

Downloaded from https://www.cambridge.org/core. IP address: 3.146.65.72, on 02 Jun 2024 at 13:25:11, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://www.cambridge.org/core/product/9B174243EDD9436BBA7EA1CC817E5FDF

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V

Coda

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12

Beyond Mining

Repair and Reconciliation

MARIANNE ELISABETH LIEN

What questions still linger when mining turns silent? What persistent issues will remain in the wake of bulldozers, rock deposits, and obsolete construction roads leading nowhere?

I drive south across Varanger mountain plateau along the road that connects north-facing fishing harbors on the Barents Sea with the bridge across the river Deatnu (Deanušaldi), which is also a junction for traffic from the Finnish border to the south, the Russian border to the east, and larger towns, like Hammerfest, Alta, and Tromsø to the west. I leave behind a coastal Arctic farmstead turned into a second home, near the Syltefjord nature reserve, where the limits of a cultivated field are still visible as a straight line painted with autumn colors, inscriptions of a state-launched agricultural program bound to falter (see Lien, 2020). I leave behind wind turbines towering on mountaintops, majestic monuments of a carbon neutral future, eating into reindeer pasture as giant scarecrows. I head toward yet another site where expansive mining operations scar an entire mountain and divide a local community, cutting friendship and kinship ties with surgical precision.

The steep and rocky mountain ridge ahead is greyish white, and rich in quartzite (Figure 12.1). It contains "proven resources for more than fifty years production" according to Elkem, operators of the quartzite mine since 1983 (Mining in the Nordics, 2021). It is one of the world's largest quartzite operations but still not large enough for the company, which is now Chinese owned. The global demand for quartzite is insatiable, they say, as quartzite is necessary for the green shift to happen. Without a six-fold expansion the current quarry will run empty fairly soon, operations will no longer be profitable, and a handful of local people will lose their jobs. Such is the rhetoric of extractive expansion.

The softer landscape behind me is rusty red and soft orange, and rich in nutrients. Reindeer, owned by the Rákkonjárga *siida* – the local reindeer herding community – pass through here twice on their annual migration from winter

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Figure 12.1 Varanger peninsula: Meahcci or ripe for quartzite extraction? Foreground: Sámi tent. Background: the scarred side of the mountain where company Elkem plans to extend quartzite mine. Photo by Marianne E. Lien

pastures inland to summer pastures on the coast. The landscapes contain nutrients to sustain such webs of life infinitely, animals and landscapes mutually sustaining each other through centuries. For an outsider, the landscape appears untouched, an obvious candidate for protection. But its *siida* leader is tired of being its warrior; tired of defending the age-old reindeer herding tradition left, right, and center, and tired of endless meetings with lawyers, local politicians, impact analysts, and Elkem representatives (Österlin & Raitio, 2020).

Each mining operation has its due date. Resource extraction thus comes to an end again and again, leaving rubble and ruination behind. Monuments of short-lived prosperity and signs of environmental destruction mark landscapes long after machinery has turned quiet (Flyen et al., 2023, see Chapter 9). Each new prospect of Arctic resource extraction marks the beginning of another turn of boom and bust. Profound local transformations blend into a repetitive pattern, in which hope and hype are short-lived assets. While each single instance presents itself as unique, the necessary sacrifice that must be made for something else to improve, we see a recurrent pattern that leaves the impression that in spite of claims to novelty it's all the same; *plus ça change, plus c'est la même chose*.[1]

This chapter draws the attention to consistent tensions of extractivism. As several previous chapters show, the massive transformations of sheer landmass that mineral extraction entails are deeply implicated in the planetary era now referred to as the Anthropocene. Resource extraction is, however, not only a driving force in the Anthropocene; it is also promoted as one of the solutions to the *challenges* of

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the Anthropocene. Shifting from fossil fuels to renewable energy sources is urgently needed as the global demand for energy shows no signs of decline. Current mining operations in the Arctic and elsewhere are part of the global competition for rare minerals for battery components needed for energy storage in a post-carbon future. Arctic landscapes are scarred by wind-turbines too, their noise disturbing reindeer, thus causing a much larger zone of pasture dispossession than the space they physically occupy. Hence, the ongoing and necessary shift away from fossil fuels and carbon dependency continues to intrude on those who dwell in the Arctic, humans and non-humans. Below the ocean surface, industrial trawlers continue to scrape the seafloor, affecting the density and diversity of deep-sea megafauna in ways that are likely to have negative feedback effects on fish populations (Buhl-Mortensen et al., 2015), thereby also posing a threat to marine food chains that have defined lifeways in the Arctic.

Adaptations to a carbon-free future may therefore cause dispossessions and disruptions that are just as detrimental to local livelihoods as the rampant destruction of the nineteenth and twentieth centuries' colonial endeavors. How then, can we avoid colonial forms of dispossessions to repeat themselves? What can be learned from the resource extractivism associated with mining in the Arctic? Which tensions remain? To ask such questions is to pay attention to colonial asymmetries, and to ask about different modes of knowing, and different modes of caring for land. This implies that we also need to challenge extractivism as a hegemonic paradigm. What does it take to recognize that rather than being predetermined along a set trajectory of development from afar, Arctic futures are indeed multiple and open-ended (Wormbs, 2018)? How might we contribute to decolonization in a region where scars run much more deeply than those immediately visible on the surface of fragile landscape formations.

This chapter suggests some persistent patterns and tensions that have enabled resource extraction in the Arctic. It draws the attention to patterns that continue to haunt and are unlikely to disappear just because another mine turns quiet. Acknowledging these is necessary for repair and reconciliation to happen. The final part of the chapter proposes some steps toward what we might think of as a post-extractive, post-colonial Arctic.

The Paradox of Distance

If you happened to set foot in a fishing village on the Norwegian Barents coast around the turn of the nineteenth century, you might find yourself at a hotspot of commercial and cultural exchange, also known as the Pomor trade. Russian vessels from Arkhangelsk would offer grain and wood in exchange for fish from Norwegian-speaking fishermen, giving rise to a now extinct pidgin language called

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"*russenorsk*," Russian-Norwegian (Minaeva & Karlin, 2020). Danish-speaking state servants would ensure some sort of colonial law and order as well as taxation. Sámi speaking *siida* groups would arrive with reindeer for summer pasture and might use the opportunity to trade in fur to acquire capital for taxes, while Finnish or Qvæn-speaking immigrants might have settled permanently to cultivate the land. Most people would be likely to take part in conversation in a language other than their mother tongue, and some would speak several languages. Each group would engage with landscapes and seascapes far beyond the village itself, reliant on sparsely populated hinterlands, and far-reaching trade networks. Comparing this village with a rural settlement further south, you might be struck by what would seem like a vibrant and dynamic microcosm, or a "melting-pot," far from the image of distant remoteness that is so often associated with the Arctic today.

Many have suggested that distance and low population density have enabled a particularly irresponsible kind of Arctic extractivism (Sörlin et al., 2023; see Chapter 2), and this is also one of the conclusions of this volume. If we suggest that rampant Arctic extractivism is made possible by distance, then we must also ask how and when such perceived distance became a defining feature of the Arctic, and for whom?

Distance is a relational term. It is defined through the framework of an often unspecified location elsewhere, usually in relation to somewhere else that is implicitly seen as a center. Today, distance is a ubiquitous characteristic attributed to practically all Arctic settlements that are part of nation states with territories beyond the Arctic Circle. Defined in relation to territorial and state borders, and state capitals and urban centers invariably located in the south, Arctic regions become "distant by default." This is the case for all Scandinavian nation states, Russia, Canada, and Alaska, where most of the nations' territories are situated north of the capital cities (which are far south of the Arctic circle). Whether these Arctic territories were included, occupied, colonized, annexed, or stolen matters less; they all came to share the feature of remoteness in relation to their respective nation states. Remoteness, or being perceived as distant, is thus a geopolitical effect of inclusion or annexation rather than a feature of the place as such.

One may argue that when state borders were drawn between Finland, Russia, Sweden, and Norway in the eighteenth and nineteenth centuries, borders that cut across Sápmi in ways that were detrimental to mobile Indigenous livelihoods, they effectively also enacted these Arctic regions as "peripheral." Once the center of its own world, Sápmi became fragmented, subject to distant, contradictory, and overlapping policies of distant geopolitical entities that are now recognized as separate and legitimate nation states.[2] In this perspective, distance becomes a colonizing effect, solidified in various practices of appropriation that together effectively orchestrate distance as a feature of the Arctic.[3] For Polar explorers, Arctic

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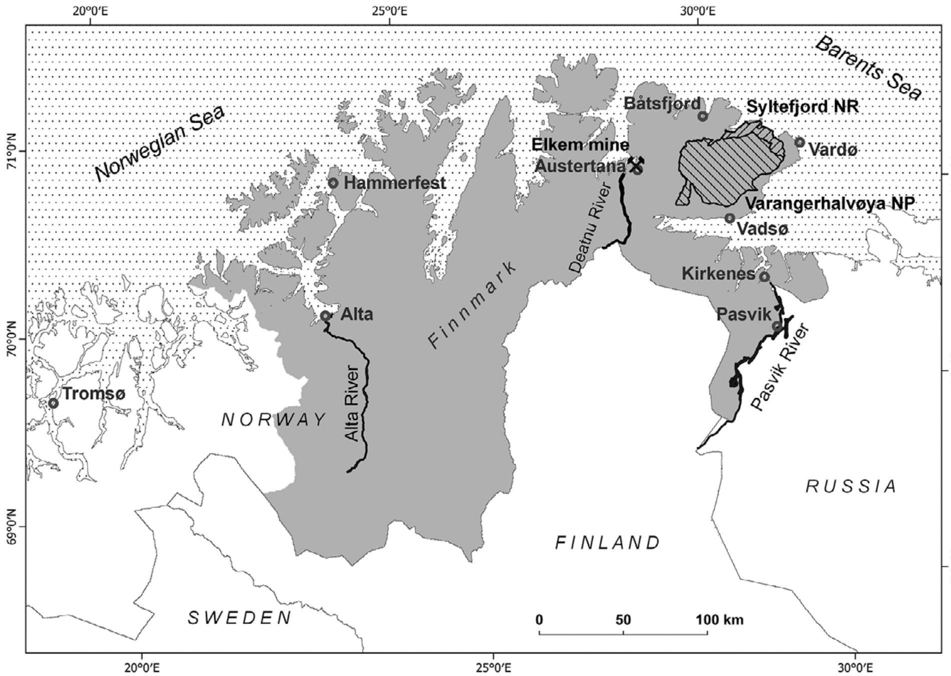

Figure 12.2 Location map of Northern Norway. Drawn by Christian Fohringer

remoteness is a logistical challenge and an obstacle to conquer; for artists and naturalists, it is a romantic feature of its attraction (Ween, 2020). But the consistent pattern of remoteness as a geopolitical effect teaches us that distance is part of a broader re-contextualization of a place, through which the power of definition is shifted from the insider's perspective to the outsider's gaze (Lien, 2003).

The asymmetry of distance continues to haunt, even when landscapes are legally protected. When the Varanger peninsula national park (NP) (Figure 12.2) was established in 2006, local inhabitants received a brochure in their mailbox, from Norwegian national authorities, presenting these "Arctic and ancient landscapes." Accompanied by stunning photos of landscape formations, their own immediate surroundings were introduced with a vignette, citing a geologist's travelogue from 1831:

> The grandeur, the curious melancholy of this scene cannot be described in words. The sacred loneliness, is for us located in the mountain ranges of the high North, or on the distant sandy shores, flushed by the ocean (Keilhau, 1831, author's translation[4]).

Rendering Varanger as "melancholic," "ancient," "Arctic," and "lonely," people in Varanger were presented with the Norwegian authorities' rather peculiar perspective of their homeland, disconnected from their own intimate knowledge and

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landscape practices. The peninsula is far from untouched; it has been a site of food procurement for infinite generations, and it still is (Lien, 2020). Silencing local practices (or rendering them irrelevant in the presentation of the national park), the Directorate of Environment indirectly paved the way for further dispossession of local livelihoods in the name of nature conservation, protection, and increased wildlife tourism in allegedly "untouched nature." Even without extractive mining, a pattern of distancing persists, enabling and justifying local Arctic people as inconvenient occupants of landscapes that have been repurposed in the name of nature conservation.

The attribution of distance (or remoteness) to sparsely populated territories within contemporary nation states seems, then, to place them at risk of becoming rampant zones of extractivism, out of sight for the majority of the state population and electorate. Locals who have carved out a living in these territories, practicing livelihoods that predate the nation-state, risk being sacrificed as well, removed or dispossessed from their subsistence livelihoods, or forced to remake themselves into persons compatible with the ambitions of progressive nation states. Being (re-) defined as remote within a modern nation state, as Arctic communities invariably are, means being locked into an asymmetrical relation in which your homeland is quite likely to become a future sacrifice zone (Reinert, 2018).

Shifting Scales and Future Commons

Most of the Varanger territory was never privately owned. Property relations in East Finnmark were not legally formalized[5] by the state until 1775, and even then, only a fraction of the territory was titled as property, partly because public servants were only sporadically present (Ravna, 2020). This lack of formally legalized ownership is the most important reason why Finnmark, like many other Arctic territories, became by default property of the Danish-Norwegian nation state, and later of independent Norway.[6] But the fact that property relations were not legally recognized by the state does not mean that the territory was not subject to ownership. Arctic ownership takes many forms but is often fluid, shifting with seasons, relational, shared, and subtle (e.g., Kramvig, Guttorm, & Kantonen, 2019; Ravna, 2020). Hence, ownership in the Arctic is not immediately legible to the apparatus of state governance. As a result, such relations of ownership are also often ignored, or perhaps it leaves local claims conveniently "out of sight" for central authorities, facilitating continued dispossession through soft colonial power. In any case, this makes Arctic (and Antarctic) territories particularly vulnerable to extractivist projects, and easily appropriated by "the logic of frontier world making" (Ogden, 2018: 68). Most importantly, fluid practices of ownership tend to leave Arctic peoples' out of the equation when revenue is distributed and

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decisions are being made. To the extent they are represented, their position is as "stakeholders" rather than as legal owners.[7]

To exemplify how Arctic ownership differs from private property, considering the Sámi term *meahcci* is instructive. Often mistranslated to the Norwegian term for outfields (*utmark)* which derives its meaning through a contrast to cultivated agricultural "infields", *meahcci* denotes an area of multiple affordances. It is a place where things get done and could be referred to as a "taskscape" (Ingold, 1993), but it is also more than that. As Joks, Østmo, and Law (2020) note, *meahcci* is multiple, shifting with seasons and used for different purposes. Hence, "*muorrameahcci* is where you collect firewood, *luomemeahcci* is where you go cloudberry picking" (Joks et al., 2020: 309). While *meahcci* is crucial for survival, it is rarely subject to individual control. Rather, it is shared in a way that is partly captured by the English term "commons." But *meahcci* is also about unpredictable encounters with lively and powerful beings (Joks et al., 2020). In this way, *meahcci* is more than a unit of shared governance that centers humans as the subject owners (Ostrom, 1990); rather, it refuses a sharp a-priori distinction between human and non-humans, or nature and culture. Finally, while *meahcci* can sometimes involve exclusivity based on internal distribution of rights, such rights are rarely absolute, and they are associated with seasonal resources rather than the territorial land as such.

Consequently, when the *siida* unit on the Varanger peninsula is pushed to recede land to wind turbines or mining operations, they cannot claim that the land "belongs" exclusively to them. It never did. All they can do is to argue that their reindeer needs the pasture at specific times of the year, and all they can hope for, if the traditional ways of using the land are sacrificed by governing authorities and the project is realized, is some form of monetary compensation for the loss of future income.

This makes *meahcci*, or the "commons-like" land Arctic inhabitants rely on not only up for grabs, a kind of "terra-nullius" that is underexploited according to the state. It also rhetorically replaces local notions of sharing in *meahcci* by notions of commons that derive their meaning from a national or planetary scale. The *siida* unit's reluctance to give up pasture may, for example, be countered by a moral imperative that Sámi too should take responsibility for the planetary "common good," such as mitigating climate change through renewable energy. Thus, the inherent reciprocity and long-term commitment between Arctic people and their specific landscapes is replaced by a *different* kind of reciprocal commitment, at a different scale. While sacrifices implied in twentieth-century mining projects were rhetorically justified in relation to the welfare state in the name of economic progress (Hastrup & Lien, 2020),[8] the sacrifices of the twenty-first century are legitimized at a global or planetary scale. Mineral extraction is now justified by future demand for minerals for battery components, while wind-turbines are

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replacing fossil fuels and mitigating climate change. In this way, *meahcci* is a sacrifice that Arctic peoples are expected to make to secure our “future commons” or the shared resources that societies require to sustain human life on earth.

Colonial Dispossession

When the Norwegian parliament agreed on initiating and supporting inner colonization (*indre kolonisasjon)* in the early 1900s, they were not thinking of overseas migration. On the contrary, in an effort to curb the wave of Norwegian citizens seeking a future in the United States, the term “inner colonization” alluded to places like Finnmark, that is, remote and northern regions of the country. These were regions where national borders with neighboring Russia and Finland had only recently been established, multiethnic regions where people were as likely to speak Finnish and Sámi (Lappish) as they were to speak Norwegian. These were “distant” places inhabited by folks who were increasingly identified as belonging to an inferior “race” (Kyllingstad, 2012). Lapps were seen as less developed in relation to human evolution, and many assumed they would naturally be overtaken by the allegedly more advanced Norwegian “race.” The term “inner colonization” was soon replaced by *bureising*,[9] which denotes the establishment of a farm (farmland) where there was none before. State support for *bureising* was granted through agricultural societies to cultivate both soil and marshes, especially in the north. Hence, Norwegian speaking farmers who intended to relocate and settle in the north could apply for a loan with favorable conditions, and state subsidies for *bureising* continued several decades after the Second World War.

Colonial dispossession across the Arctic goes far beyond the realm of industrial mining. “Inner colonization” is not just an archaic term discussed in the Norwegian parliament more than a hundred years ago. As pointed out in various ways across the present volume, it is a specific frame of mind, preceding the extractivist paradigm (Sörlin, 2023, see Chapter 1) but still visible today (Lien, 2021). It is a premise for policies that continuously seek “development” of a region seen as “lacking,” and crucial in the making of Arctic minerals as resources ripe for extraction. The option of not fully considering the sacrifices entailed in resource extractivism rests, I suggest, on this colonial disposition, which, in turn, facilitates further dispossession (Sörlin et al., 2023, see Chapter 2).

The discovery in 2021 of unmarked graves from Canadian boarding schools is a particularly stark example of the shattering atrocities bestowed on Indigenous peoples whose suffering persists (e.g., Simpson, 2014; Stevenson, 2014). In Scandinavian Sápmi, the aftermath of national borders led to forced migration and broken kinship ties that still haunt (e.g., Labba, 2021). Dispossession concerns not only land as such, or the specific area that the mining operation claims for

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extraction. Modes of knowing, of language, and of identity have been undermined simultaneously, often justified by racial paradigms.

Such paradigms informed not only early twentieth century parliamentary debates in Arctic nation states (as exemplified above) but also national policies concerning schooling, health (Stevenson, 2014), language policy, hunting regulations (Blaser, 2009), property regulations (Helander, 2004), and museums and cultural heritage (Finbog, 2021) to mention but a few areas of colonial dispossession. Caring for worlds beyond the human cannot be disentangled from the words in which such worlds are spoken. To dwell in the Arctic is to engage what Mikkel Nils Sara (2009) calls the co-existence of predictability and unpredictability, often overlooked in nature management policy, which is nearly always framed in the hegemonic language of the nation state.

What is the basis for social and environmental justice in the aftermath of these circumstances? If the Arctic is deeply transformed by colonial dispossession, scarred by loss at multiple levels, how then can it become a sovereign region? A common political response is to hand over responsibilities for difficult decisions to local governments, at the municipal or county level. This is the situation in current controversies over mining in Finnmark. A major factor in reopening a contested coppermine in Repparfjord, for example, was a decision in favor by a narrow majority in the municipal council. In Varanger, the planned expansion of the Elkem quartzite mine has divided the small village of Austertana, pitting kin and neighbors against one another, just as it divided the council of the "Finnmark Property," which opposed the plan by the double vote of its chairman.

While the expansion remains unsettled, local divisions grow deeper. In this way, current modes of "post-colonial" governance that seek to hand over jurisdiction to the local level may inadvertently result in a "divide and rule" situation, with conflicts nearly as destructive for local livelihoods as the mining project itself. The problem is one of scale but also concerns modes of knowing. For the *siida* leaders negotiating with a Chinese-owned company and their professional consultants and impact analyses is nearly an impossible task. Representing only their own *siida* unit, and with practically no support from any institutional level other than their own lawyers, the unfolding battle echoes the story of David against Goliath.

Österlin and Raitio (2020) have proposed the term "double pressure" to capture such inter-related processes of fragmented landscapes and what they call fragmented "planscapes," and the pressures that these multiple battles represent for affected communities of reindeer owners. Several chapters in this volume (e.g., Österlin et al., 2023, see Chapter 5; Rosqvist et al., 2023, see Chapter 6) suggest that reindeer owners are not the only ones affected by extractive operations, hence the term double or multiple pressures has a broader application. The stark

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discrepancies of sheer power and scale between multinational extractive industries on the one hand and local Arctic communities on the other exacerbates the situation even more. How then, can local communities and Indigenous peoples attain the empowerment needed to withstand the overwhelming strength of multinational mining companies? Wounded by a policy pattern of "divide and rule," what sort of hope exists for what we might tentatively think of as a post-colonial Arctic?

To ask such questions is to move beyond mining, and slightly beyond the scope of the present volume. Much work is already done, and especially by Indigenous scholars (Sara, 2009; Simpson, 2014; Joks et al., 2020; Finbog, 2021) to define a post-colonial future in the Arctic.

Evidentiary Practices in the Face of Loss and Disruption

Struggling to capture the continuities of successive epidemics among Canadian Inuits (tuberculosis in the 1940s, suicide since the 1980s), Lisa Stevenson embraces uncertainty as the only way of paying attention to the "moments when the facts falter" (Stevenson, 2014: 2). The suffering and loss, which is still unfolding, calls for an epistemological approach that transcends the evidentiary practices of conventional science. Stevenson (2014: 2) proposes:

> a mode of anthropological listening that makes room for hesitation – a way of listening for that which persistently disrupts the security of what is known for sure. This entails taking the uncertain, the confused – that which is not clearly understood – as a legitimate ethnographic object.

Searching for a way to talk about life that is, as she phrases it "constitutively beside itself," Stevenson's intervention has relevance beyond the atrocities of Inuit epidemics. Loss is inevitable in colonial encounters, and some forms of loss can hardly be articulated. How can we even begin to address the loss of the ability to speak the language that was denied to you by your parents, in their well-meaning attempt to protect their child from the destined discrimination bestowed on speakers of an Indigenous language. Such is the loss of those who grew up in post-war Finnmark, for example (Lien, 2020). How can we address the loss of land, of *meahcci* among people of the *siida* that happened to cross the Norwegian-Swedish border on their way to summer pastures, when their access to the coast was denied by the state? Such is the loss of Sámi of Swedish citizenship during the decades that followed Norway's independence from Sweden in 1905, as the members of the now fragmented *siida* group were forcibly relocated to unfamiliar terrains much further South (Labba, 2021). And how can we address the loss of an entire *siida* group of East Sámi (also known as Skolt Sámi), who in the aftermath of the establishment of the border with Russia in 1826 chose to be Russian citizens

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and were forced to regroup on the Eastern side of the Pasvik river (Andersen, 1989)? Their subsequent loss as "collateral damage" in several wars and political upheavals is beyond the scope of this chapter, but serves here as a reminder of what colonial relocation and loss may entail.

Similar reflections are articulated by anthropologist Yael Navaro's more recent article (2020) proposing what she calls "a negative methodology" as an epistemological approach in the aftermath of mass violence. Navaro is concerned with conditions of possibility for anthropological and historical work in relation to prolonged mass violence, and is critical of conventional anthropology's "positive outlook for evidentiary practices in the field" (Navaro, 2020: 161). More precisely, she draws on how the scholars working in the aftermath of mass atrocity have developed ethnographic methods that seek to address the gaps and hollows in such sites, summarized by what she calls "a negative methodology." This approach may be appropriate when the accessibility of evidence cannot be assumed, when no archive is available, witnesses are missing, or forcibly relocated, or perhaps "refashioned" into another way of inhabiting the world. Navaro has mass violence in mind and focuses on people. In relation to extractivism in the Arctic, we may also ask what a negative epistemology might look like in the aftermath of rampant landscape transformation. How can we grasp the triple undoing of peoples or livelihoods and of landscapes that is a feature of ruination in the North?

One way to approach this is to be attentive to subtle materials, traces in the landscape, and in the people who remain, which might inadvertently open up spaces for posing questions differently. What stories linger between the lines, and what remains unspoken? What sort of absences are produced in the assembling of archival material? And what might a rust-covered plough tell us about projects that failed? Such questions may stitch together fragments of lives that may contribute to an acknowledgment of loss, intervening into persistent patterns, and possibly also be helpful as a first step toward reconciliation.

Notes

1 Jean-Baptiste Aplhonse Karr, 1849, *epigram on the January issue of his journal Les Guêpes (The Wasps)*. (Source, Wiktionary).

2 Map-making is an important practice of nation building, In the Finnmark region, mayor Peter Schnitler's protocols from 1742–1745 are of particular importance (for details, see Hansen & Schmidt, 1985).

3 For a similar argument relating to Australian conceptions of distance, see Lien, 2005; Blainey, 2001. For a material semiotics approach to distance and objects, see Law, 2002.

4 In Norwegian "*Denne hellige ensomhed, som i den nye verdensdel endu bor i urskogene, er hos os hentyet til det høie nordens fjeldstrøkninger eller til disse fjerne strandbredder, som havet beskyller*." Source: B. M. Keilhau 1831, available on: www.altabibliotek.net/finnmark/Keilhau/Reise.php (accessed 21 December 2021).

5 The legal term in Norwegian is that it remained "*umatrikulert*," and thus by default property of the Danish-Norwegian state (Ravna, 2020).

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6 In 2005, this was handed over to a new legal entity called the Finnmark Property (for details, see Ween & Lien, 2012).
7 As Sverker Sörlin has argued,"the stakeholder concept has served, perhaps inadvertently, the purpose of limiting the controversy to those with acknowledged rights to speak because of their stakes, as landowners, residents, community members" (Sörlin, 2021: 5).
8 Examples include the Alta River for Norway's hydroelectric reserves, Kirkenes and Kiruna for much needed iron ore.
9 The term was first used in the Norwegian parliament by Klaus Sletten in a speech in 1918 (Almås, 2002: 76; for *bureising,* see Lien, 2020).

References

Almås, R. (2002). *Norges Landbrukshistorie IV*. Oslo: Det Norske Samlaget.
Andersen, A. (1989). *Sii'daen som forsvant: Østsamene i Pasvik tter den norsk-russiske grensetrekningen i 1826*. Kirkenes: Sør-Varanger Museum.
Blainey, G. (2001). *The Tyranny of Distance: How Distance Shaped Australia's History*. Sydney: Macmillan Australia.
Blaser, M. (2009). The threat of the Yrmo: The political ontology of a sustainable hunting program, *American Anthropologist*, 111(1), 10–20.
Buhl-Mortensen, L., Ellingsen, K. E., Buhl-Mortensen, P., Skaar, K. L., and Gonzalez-Mirelis, G. (2015). Trawling disturbance on megabenthos and sediment in the Barents Sea: chronic effects on density, diversity, and composition. *ICES Journal of Marine Science*, 73(1), i98–i114. https://doi.org/10.1093/icesjms/fsv200
Finbog, L-R. (2021). It speaks to you – Making Kin of People, Duodji and Stories in Sami Museums. PhD thesis, Faculty of Humanities, University of Oslo.
Flyen, A-C., Avango, D., Fischer, S., and Winqvist, C. (2023). Remediating mining landscapes. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Hansen, L-I. and Schmidt, T. (1985). *Major Peter Schnitlers grenseeksaminasjonsproto-koller 1742–745, I–III*. Oslo: Norsk Historisk Kjeldeskrift-Institutt.
Hastrup, F. and Lien, M.E . (2020). Welfare frontiers? Resource practices in the Nordic Arctic anthropocene. *Anthropological Journal of European Cultures* 29(1), v–xxi. https://doi.org/10.3167/ajec.2020.290101
Helander, K. R. (2004). Treatment of Saami settlement names in Finnmark in official Norwegian place name policy. *Diedut*, 30(3), 102–119.
Ingold, T. (1993). The temporality of the landscape. *World Archaeology*, 25(2), 152–174.
Joks, S., Østmo, L., and Law, J. (2020). Verbing meahcci: Living Sámi land. *The Sociological Review Monographs*, 68(2), 305–321.
Keilhau, B. M. (1831). *Reise i Øst- og Vest-Finmarken samt til Beeren-Eiland og Spitsbergen, i Aarene 1827 og 1828*. Christiania: Johan Krohn. www.altabibliotek .net/finnmark/Keilhau/Reise.php
Kramvig, B., Guttorm, H. E., and Kantonen, L. (2019). Pluriversal stories with Indigenous wor(l)ds creating paths behind the next mountain. *Dutkansearvvi dieđalaš áigečála*, 3 (2), 149–162.
Kyllingstad, J. R. (2012). Norwegian physical anthropology and the idea of a Nordic master race. *Current Anthropology*, 53(5), 546–556.
Labba, E. A. (2021). *Herrene sendte oss hit: Om tvangsflyttingen av samene*. Oslo: Pax forlag.
Law, J. (2002). Objects and spaces. *Theory, Culture and Society*, 19(5/6), 91–105.

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Lien, M. E. (2003). Shifting boundaries of a coastal community: Tracing changes on the margin. In T. H. Eriksen, ed., *Globalisation: Studies in Anthropology*. London: Pluto Press, pp. 99–121.
Lien, M. E. (2005). "King of Fish" or "feral peril"? Tasmanian Atlantic salmon and the politics of belonging. *Environment and Planning D: Society and Space*, 23, 659–671.
Lien, M. E. (2020). Dreams of prosperity, enactments of growth: The rise and fall of farming in Varanger. *Anthropological Journal of European Cultures*, 29(1), 42–62. https://doi.org/10.3167/ajec.2020.290104
Lien, M. E. (2021) Interruptions: Affective futures and uncanny presences at Giemaš, Finnmark. *Polar Record*, 57, e1. https://doi.org/10.1017/S0032247420000443
Minaeva T. S. and Karelin V. A. (2020). Language contacts between Pomors and Norwegians during expeditions to Svalbard in the second half of the 18th — first half of the 19th centuries. *Arktika i Sever [Arctic and North]*, 2(38), 140–151. https://doi.org/10.37482/issn2221–2698.2020.38.140
Mining in the Nordics. (2021). Elkem ASA. Website. www.miningnordics.com/companies/elkem-asa
Navaro, Y. (2020). The aftermath of mass violence: A negative methodology. *Annual Review of Anthropology*, 49, 161–173.
Ogden, L. (2018). The Beaver diaspora: A thought experiment. *Environmental Humanities*, 10(1), 63–85.
Österlin, C. and Raitio, K. (2020). Fragmented landscapes and planscapes: The double pressure of increasing natural resource exploitation on Indigenous Sámi lands in Northern Sweden. *Resources*, 9(104), 1–27. https://doi.org/10.3390/resources9090104
Österlin, C., Heikkinen H. I., Fohringer, C., Lépy, É., and Rosqvist, G. (2023). Cumulative effects on environment and people. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Ostrom, E. (1990). *Governing the Commons*. Cambridge: Cambridge University Press.
Ravna, Ø. (2020). Den tidligere umatrikulerte grunnen i Finnmark: Jordfellesskap fremfor statlig eiendom? *Tidsskrift for Rettsvitenskap*, 133(2–3), 221–263.
Reinert, H. (2018). Notes from a Projected Sacrifice Zone. *ACME: An International Journal for Critical Geographies*, 17(2), 597–617.
Rosqvist. G., Heikkinen, H. I., Suopajärvi, L., and Österlin, C. (2023). How should impacts be assessed? In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Sara, M. N. (2009). Siida and traditional Sámi reindeer herding knowledge. *The Northern Review*, 30, 153–178.
Simpson, A. (2014). *Mohawk Interrupts. Political Life across the Borders of Settler States*. Durham, NC: Duke University Press.
Sörlin, S. (2021). Wisdom of affect? Emotion, environment, and the future of resource extraction. *Polar Record*, 57(e27), 1–9. https://doi.org/10.1017/S0032247421000097
Sörlin, S. (2023). The extractivist paradigm: Arctic resources and the planetary mine. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Sörlin, S. Dale, B., Keeling, A., and Larsen, J. N. (2023). Patterns of Arctic extractivism: Past and present. In S. Sörlin, ed., *Resource Extraction and Arctic Communities: The New Extractivist Paradigm*. Cambridge: Cambridge University Press.
Stevenson, L. (2014). *Life beside Itself. Imagining Care in the Canadian Arctic*. Oakland: University of California Press.

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Ween, G. (2020). The map machine: Salmon, Sámi, sand eels, sand, water and reindeer. Resource extraction in the High North and collateral landscapes. *Polar Record*, 56, e19. https://doi.org/10.1017/S0032247420000236
Ween, G. and Lien, M. E. (2012). Decolonialization in the Arctic? Nature practices and land rights in the Norwegian High North. *Journal of Rural and Community Development*, 7(1), 93–109.
Wormbs, N., ed. (2018). *Competing Artic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan.

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13

Postscript

Extractivism after the "New Arctic"

SVERKER SÖRLIN

There is nowadays no shortage of books on the Arctic – and this is the last chapter of yet another one. What is different at the end of the read? To answer that question, let me start with a reflection on the understanding we had when we embarked upon writing this book. Despite the rich diversity of publications on the topic, it is possible to discern a few major lines of analysis in the growing body of literature on contemporary Arctic change. One such approach consists of attempts to map and take stock of state-of-the-art knowledge on multiple dimensions of environment, climate, and social conditions in the region. In this category we find the rising genre of "assessments," many issued by the Arctic Council, of for example: biodiversity, pollution, human health, snow and ice, climate adaptation, impacts of climate change, and a range of other topics. The *Arctic Human Development Reports* (Einarsson et al., 2004; Fondahl & Larsen, 2014) also belong here, typically broad, multi-authored, anchored in new research, and accessible for wider policy and professional audiences. An attempt to synthesize this broad strand of knowledge was the *Arctic Resilience Report* (Carson & Peterson, 2016). It compiled an impressive amount of data from many knowledge areas and established better understanding of complex relationships but had less to say about how to interpret this new knowledge and how to use it to address the challenges.

Another line of research in the last two decades has been on the "new Arctic" in the post-Cold War era. It is represented by several books and reports on the melting of sea ice, opening of sea routes, globalizing tourism, and more generally a release of economic opportunities, including a boom in mineral and energy resources. This literature – itself an old tradition of resource myth and lore in Arctic affairs – saw a peak in the early 2010s with titles such as Charles Emmerson's, *The Future History of the Arctic* (2010) and Lawrence C. Smith's, *The New North: Our World in 2050* (2011). For a period, this perspective of a Glasnost plus end of Cold War 1989 "rupture" was predominant, and the "new" kept creeping into the very language of Arctic reporting, conferencing, and books,

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such as *The New Arctic* (Evengård, Larsen, & Paasche, 2015), or *Brave New Arctic* (Serreze, 2018). The titles themselves could be quite different, and not all books shared in the hype. The language and the framings were often common, however, and the political significance of this, for some time almost paradigmatic, understanding of the Arctic future cannot be overestimated.

Well into the Agenda 2030 decade, and after dramatic swings of both mineral and oil and gas markets, this already seems a long time ago. Much of what the speculations were based on, such as massive extraction of fossil fuel resources, is now surrounded by deep uncertainty related to the decarbonizing agenda that followed the 2015 Paris agreement and the UN Sustainable Development Goals (SDGs) from the same year, the former reinforced by the Glasgow COP meeting in 2021. Nor do the previous chapters of this book really offer much cause to support the rosier futures that were in circulation. It seems that the expansionist, resource hype version of the twenty-first century Arctic is losing some of its relevance as world and regional developments have taken new turns.

Path Dependency: The Extractivist Curse?

What has come instead? It is hard to say. Plans to continue and grow resource extraction remain for sure, but the hype is no longer there. The Arctic is certainly heating, but it is no longer as "hot." The scholarly and policy-related literature in recent years reflects a mood of concern and critical reflection. We could go back to Oran Young's foundational book on *Arctic Politics* (1992). He predicted, as it turned out quite correctly, that the Arctic after the Cold War would gravitate into a more significant role in world affairs and occupy a position as a region with its own brand and agenda. The reasons he gave were several, including interesting experimentation in multi-level governance and the testing of international cooperation regimes. Another important reason was the extraction of natural resources:

> [T]he Far North, which is undoubtedly a storehouse of raw materials of great value to advanced industrial societies, has become a critical arena, not only for those desiring to reexamine the efficacy of traditional resource regimes but also for those wishing to dig deeper in an effort to rethink the bases on which we organize human/environment relations (Young, 1992: x).

While innovative, this way of looking at the region had an in-built ambivalence. The Arctic was an emerging policy *subject*, thawing out after the long Cold War freeze, with a voice of its own and seeking new ways forward. At the same time, it remained an *object* of security and resource politics from southern states, for which an endogenous development of the Far North was, literally, a peripheral issue,

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especially for the emerging Arctic wannabes, such as India, China, South Korea, and Japan. As an effect of this dual outlook, the energy and vibrancy in the Arctic literature was directed both on the commercial growth of resource extraction and on policy innovation in international relations, markedly the Arctic Council, which started in 1996 as a genuinely new post-Cold War institution for governance in the north (Burke, 2020).

At first, this growing literature endorsed the post-1989 development, but with time, it also marked the shifting conjunctures for the Arctic in the international arena. Carina Keskitalo's analysis of the post-Cold War regionalization, *Negotiating the Arctic: The Construction of an International Region* (2004) is a case in point, and can be juxtaposed with her own edited collection, *The Politics of Arctic Resources* (2019) less than two decades later. While the first presented the birth of a modern transnational Arctic as subject, the latter volume took a distinctly different view, looking at continuities and patterns over the long term and articulating a more complex, diverse, and ambiguous set of Arctic relations.

Other synthetic approaches in recent years have presented similar perceptions of an Arctic region where less has changed than anticipated, either in the real-life conditions of communities or in the stature of the Arctic in the wider scheme of world affairs. On most public health, educational, and other social and welfare indicators, the Arctic region lags behind compared to the southern parts of Arctic states. To this pattern, the Nordic countries are an exception, linked to the integrative policies of these countries going all the way back to Christian mission and national policies in the eighteenth and early nineteenth centuries on the principle of equality within the national territory (Sörlin, 2019).

Entering the Agenda 2030 decade, the deep Cold War past still casts long shadows on the Arctic (Bocking & Heidt, 2019). Whatever innovative policy solutions may come up, the Arctic seems set on a resource-oriented path dependency where "history matters" (Tilly, 1988). The Eurasian Arctic remains closely tied to Russian security and economic interests (Josephson, 2014). In Sweden, the far north is embarking on a massive "new industrialization," taking a "lead position in the new industrial revolution, shifting to technologies aimed to slow climate change" (Nilsen, 2021). The shift is propelled by the availability in the region of many forms of minerals, "green" electric energy, and the potential to produce fossil-free steel in just a few years, repeating the natural resource hype of ca. 1900, when the north was the "Land of the Future" (Sörlin, 1989). Norway has abandoned coal in Svalbard, but on the other hand moves prospecting for oil and gas further north into the Barents Sea, actually not far from the Svalbard coast. It also takes a forward-leaning position in the UNCLOS process, arguing that all islands in the Svalbard archipelago be surrounded by the 200 nautical mile boundary, wanting to secure vast areas of the Arctic Ocean for domestic offshore extraction.

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Sustainabilities: A Plural?

The much-desired state of sustainability has also been the topic of lively discussions, which does not seem to diminish its phantom-like characteristic, hard to grasp and even harder to realize (Fondahl & Wilson, 2017). Nor do the geopolitical framings of the Arctic seem to establish any convergence, and the Arctic Council, however innovative and functional, remains an exclusive club-like vessel for a rather limited set of issues (Dodds & Powell, 2014; Burke, 2020). The fate of individual communities is unpredictable and diverse, as many of the cases in this volume suggest. Forced migrations are sadly a common phenomenon around the circumpolar Arctic (Bronen, 2014; Labba, 2020). Qaanaaq in North Western Greenland is one example. Its 650 inhabitants are the descendants of villagers who were moved a hundred kilometers north in the 1950s to enable the expansion of the United States Thule Air Base. Today they adapt as best they can to disintegrating ice and shorter hunting seasons due to climate change, demonstrating resilience and a capacity for survival but not necessarily enjoying a state of sustainability (Hastrup, 2017, 2020).

In many studies, the innate political character of sustainability has become both articulated and critiqued. It is oriented toward the future, but the normative function that this word signals remains weak, which also makes assessing the past and the present hard, and Arctic scientists often shy away from drawing the gloomier conclusions for fear of having overstated their case (Wormbs, 2015). Even a broad circumpolar review of sustainable development gives little reason for genuine satisfaction about the progress of sustainability "on the ground" (Gad & Strandsbjerg, 2018), although the rich diversity of resources in a multiplicity of Arctics could also give rise to an idea of "sustainabilities" in the plural and therefore some optimism (Tennberg, Lempinen, & Pirnes, 2020). In the last decade the mood has shifted from a unidirectional trajectory toward a rising Arctic to an understanding that futures are also in the plural, hence some brighter and others far less so. What these futures will become is undetermined and ultimately the responsibility of people and the outcome of different, opposing politics, as suggested in a volume with precisely that title, *Competing Arctic Futures* (Wormbs, 2018).

Impressive as much of this literature is, with a sizable growth in research output from the social sciences and humanities during and after the Fourth International Polar Year 2007–2008, some of its policy-oriented contributions remained for a long time predicated on unfounded expectations of future economic growth and resource-based societal transformation. More recent work, such as the literature cited previously, has already started to reflect on new and more diverse approaches. This literature suggests that there is little uniformity. In that, Oran Young's assumptions were somewhat overstated. Clearly, there has been a regional formation, and the Arctic has gained a higher profile as a region in world

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affairs. However, the interests within the region are less coherently presented than could be expected, and much of the decision making takes place with interests outside of the region in mind. The Arctic may have grown as a political object, but as a subject not as much.

A possible conclusion is this: While the past couple of decades saw a proliferation of approaches united by the notion that the post-1989 Arctic was a very special and forward-looking place, in the 2020s this view is changing dramatically. The trajectories of change are less distinct and paradigmatic than previous understanding suggested. The challenges are perhaps even more profound, but not so uplifting, rather disturbing, potentially devastating. The glorious future envisioned is, in reality, much more uncertain, with some of the visions even more unlikely than they were pre-1989. Back then, détente and sustainable development were held out as an opportunity, but most of the promises came to little. The future Arctic of the 2020s is no longer as "new," and certainly not as merry as that which was hyped for decades but not delivered.

Entering the Extractivist Paradigm

Part of this adjustment to realities has come from experiences of resource extraction. It is a crucial part of the path dependency in the Arctic. We have argued throughout this book that it is always there and that it changes only in form and intensity. We also argue that resource extraction has expanded its reach and has already been turning into resource extractivism, which is more than the extraction itself. It is a social formation and an outlook on the world. We asked: Could resource extraction co-exist in harmony with Indigenous and settler communities? Could even the Arctic become a vanguard of responsible mining and extraction? Ultimately of sustainability.

We have found some progress, explored ways of transitioning from extraction to post-mining futures and wiser forms of collaboration and consultation, and seen alliances between multiple actors find new ways forward for sustainable development. Some initiatives are very recent and can spur progress in years to come. New Arctic strategies, focusing on people and local development, were adopted by the pan-Nordic Sámi (2019) and the European Union (2021). The updated EU Arctic strategy has been welcomed by the Sámi community for its respect for Indigenous communities and its demand that fossil fuels should stay in the ground but has also been met with concern for its focus on the Arctic's potential as a region of renewable energy production.[1]

However, we have also seen political inertia and additional "multiple pressures" on local, especially Indigenous, communities. Resources, landscapes, cultures, and livelihoods are severely affected by the expanding extraction operations. In

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addition to these accumulated changes, the last few decades have seen the start of what most envision, and hope, will become a period of transformational change to meet the UN SDGs, and say a last goodbye to the fossil fuel regime that the modern world is increasingly suffering from. Such a farewell to the fossil fuel age would mean a great deal for Arctic futures. Without it, the Arctic as we know it would be in serious trouble for the rest of this century.

The crux, though, is that the new resources that the Arctic can offer to the world as it transitions – mines for copper, nickel, iron ore, and rare earth minerals, as well as energy from hydro and wind – at present risk making things worse. Arctic extraction does not seem to foster more sustainable and thriving local communities in any straightforward fashion. It seems, on the contrary, to cement the Arctic's position as a predominant raw materials region with communities that are depopulating, albeit with occasional centers of growth. It is a genuine dilemma, since extraction also means advantages for some in the short term.

At present, we do see a phasing out of some mining, especially coal in the European Arctic. There is growth in alternative sources of income such as tourism, and investments in science with huge observation stations and networks collecting data about climate and environment. The flipside of that coin is that the data typically are used elsewhere. Monitoring the planet doesn't necessarily build community in any single site. Tourism has its extractive properties, wearing and tearing on environments and cultures, and in some areas of the Arctic its sustainability is already seriously questioned (Runge, Daigle, & Hausner, 2020). Extraction and harvesting come in different shapes and sizes. It is not just extraction per se, it is also institutions, policies, knowledge, and a state of mind that tend to reinvent themselves and expand into new domains.

We have called all of this this *the new extractivist paradigm*. It is a concept for an expanding, contemporary extractivism that encompasses ever more sectors of society and the economy. It may not be what we had wanted to find, but even undesired results are results. The pathways the Arctic is currently on will not build the sort of sustainability that aligns itself with the demands of the UN SDGs.

Radically different development models for the Arctic are urgently required. It probably means new trade-offs, if the transition to a fossil-free world is going to be a "just transition" for the Arctic. This fairly small and vulnerable part of the world, with a mere four million of the world's soon eight billion inhabitants, cannot carry the burden of supplying large parts of the world's needs for energy and minerals. Nor can prohibitions and restrictions be imposed on communities that have been highly dependent on such extractive activities for employment, investment, and training. As many Indigenous communities in the Arctic have complained, a heavy-handed "green colonialism" is making itself felt with new demands for mining to cease in order that the Arctic be "saved" from further privation.

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This is a serious thing. After several post-1989 decades of Arctic resource hype and frenzy, it is time to face the realities of the green transition, as the fossil fuel regime will remain up and running for some time yet. A bountiful Arctic functioning as a resource frontier may seem beneficial for the world as a whole – just as outsiders often wish to ensure that the Arctic continues to be imagined and framed as a "wilderness" rather than an extractive-industrial hinterland with settler and Indigenous communities living and working within it.

This is the Arctic paradox. The Arctic already serves as the bellwether of global climate change, with melting ice, thawing permafrost, and receding snow covers. It is right now sliding ever deeper into the role of a global resource hinterland whose own future is subservient to saving smooth transitions elsewhere. Nor is it easy for Arctic communities and citizens to take their own decisions and choose when to use a resource and when not to. They are trapped in the strategies of their nation states, and in copious external resource demand.

Local populations are sometimes divided. Indigenous corporations in Alaska want oil extraction to continue, and some Inuit communities in Greenland stand behind the, now abandoned, prospect of excavating uranium. They are Arctic outliers of strong international interests, commercial and geopolitical, from around the world, who want nothing else than for extraction to continue, however problematic it may be. Others try to argue that new pathways, not yet seriously discussed, must be carved out and compromises struck. There are pan-Arctic business voices arguing for investment in infrastructure, mineral, renewable energies, and for clean, green, and sustainable use of fish and other marine life.[2]

Sustainable resource development will have to transcend and surpass the extractivist path dependency. The chapters of this book have shown that the time-perspective of extraction must be very long and allow for post-extractive futures that are viable and attractive to local residents and Indigenous communities. These chapters have also shown the importance of affect and of participatory deliberation that is not just symbolic. The book has demonstrated clearly that existing forms of extraction remain insensitive to values that are essential for communities. To overcome this, critical and careful navigation is necessary. It will require ingenuity, skill, endurance, and collaboration. Geopolitically, it is a massive challenge given the determination of Arctic states to assert their permanent sovereign rights over Arctic territories.

This book is about the Arctic, but the way the Arctic is changing reflects, more than ever, change going on in other parts of the world. The external forces acting on the region are strong, and the stakes are high. The Arctic has, quite recently, been presented as an opportunity, a bonanza, a future for the world. In this book's rendering, it comes across as a moral and political test case. Not just for Arctic states but for the world.

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Notes

1 www.saamicouncil.net, visited January 27, 2022.

2 An example is the Arctic Economic Council. See: www.nib.int/cases/invest-in-arctic-solutions-for-global-green-transformation, visited January 27, 2022.

References

Bocking, S. and Heidt, D., eds. (2019). *Cold Science: Environmental Knowledge in the North American Arctic during the Cold War*. London: Routledge.

Bronen, R. (2014). Choice and necessity: Relocations in the Arctic and South Pacific. *Forced Migration Review*, 45, 17–21.

Burke, D. C. (2020). *Diplomacy and the Arctic Council*. Montreal and Kingston: McGill-Queen's University Press.

Carson, M. and Peterson, G., eds. (2016). Arctic Resilience Report. Stockholm: Arctic Council, Stockholm Environment Institute and Stockholm Resilience Centre. www.arctic-council.org/arr.

Dodds, K. and Powell, R. C., eds. (2014). *Polar Geopolitics: Knowledges, Resources and Legal Regimes*. Cheltenham: Edward Elgar.

Einarsson, N., Larsen, J. N., Nilsson, A., and Young, O. R. (2004). *Arctic Human Development Report*. Akureyri: Stefansson Arctic Institute, under the auspices of the Icelandic Chairmanship of the Arctic Council 2002–2004.

Emmerson, C. (2010). *The Future History of the Arctic: How Climate, Resources and Geopolitics Are Reshaping the North, and Why It Matters to the World*. London: Vintage Books.

Evengård, B., Larsen, J. N., and Paasche, Ø. (2015). *The New Arctic*. Cham, Heidelberg, and New York: Springer.

Fondahl, G. and Larsen, J. N., eds. (2014). *Arctic Human Development Report: Regional Processes and Global Linkages. TemaNord 2014:567*. Copenhagen: Nordic Council of Ministers.

Fondahl, G. and Wilson, G. N., eds. (2017). *Northern Sustainabilities: Understanding and Addressing Change in the Circumpolar World*. Cham: Springer.

Gad, U. P. and Strandsbjerg, J., eds. (2018). *The Politics of Sustainability in the Arctic: Reconfiguring Identity, Space, and Time*. Abingdon and New York: Routledge.

Hastrup, K. (2017). The viability of a high Arctic hunting community: A Historical perspective. In M. Brightman and J. Lewis, eds., *The Anthropology of Sustainability: Beyond Development and Progress*. New York: Palgrave, pp. 145–164.

Hastrup, K. (2020). Thule as frontier: Commons, contested resources, and contact zones in the high Arctic. *Anthropological Journal of European Cultures*, 29(1), 1–19. https://doi.org/10.3167/ajec.2020.290102

Josephson, P. (2014). *The Conquest of the Russian Arctic*. Cambridge, MA: Harvard University Press.

Keskitalo, E. C. H. (2004). *Negotiating the Arctic: The Construction of an International Region*. New York: Routledge.

Keskitalo, E. C. H., ed. (2019). *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. Abingdon and New York: Routledge.

Labba, E. A. (2020). *Herrarna satte oss hit*. Stockholm: Norstedts.

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Nilsen, T. (2021). North Swedish battery gigafactory expands before production start. *The Barents Observer* article. https://thebarentsobserver.com/en/industry-and-energy/2021/06/north-swedish-battery-gigafactory-expands-production-start

Runge, C. A., Daigle R. M., and Hausner, V. H. (2020). Quantifying tourism booms and the increasing footprint in the Arctic with social media data. *PLoS ONE* 15(1): e0227189. https://doi.org/10.1371/journal.pone.0227189

Serreze, M. C. (2018). *Brave New Arctic: The Untold Story of the Melting North*. Princeton, NJ: Princeton University Press.

Smith, L. C. (2011). *The New North: Our World in 2050*. London: Profile Books.

Sörlin, S. (1989). *Land of the Future: Norrland and the North in Sweden and European Consciousness*. Umeå: Center for Arctic Cultural Research, Umeå University.

Sörlin, S. (2019). State and resources in the North: From territorial assertion to the "*smorgasbord* state." In E. C. H. Keskitalo. ed., *The Politics of Arctic Resources: Change and Continuity in the "Old North" of Northern Europe*. Abingdon and New York: Routledge, pp. 38–61.

Tennberg, M., Lempinen, H., and Pirnes, S., eds. (2020). *Resources, Social and Cultural Sustainabilities in the Arctic*. London: Routledge.

Tilly, C. (1988). Future history. *Theory and Society*, 17(6), 703–712. https://doi.org/10.1007/BF00162616

Wormbs, N. (2015). The assessed Arctic: How monitoring can be silently normative. In B. Evengård, J. N. Larsen, and Ø. Paasche, eds., *The New Arctic*. Cham: Springer, pp. 291–301.

Wormbs, N., ed. (2018). *Competing Arctic Futures: Historical and Contemporary Perspectives*. New York: Palgrave Macmillan.

Young, O. R. (1992). *Arctic Politics: Conflict and Cooperation in the Circumpolar North*. Hannover, NH and London: University Press of New England.

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