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IN RELATION TO EXTRACTIVE INDUSTRIES IN GREENLAND

BY
PARNUNA PETRINA EGEDE DAHL

PhD Thesis 2024

AALBORG UNIVERSITY
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BIO

Parnuna Egede Dahl is a joint PhD candidate at Ilisimatusarfik/University of Greenland at the Institute of Social Science, Economics and Journalism, affiliated with the Arctic Oil and Gas Research Centre – and Aalborg University at the Department of Sustainability and Planning, affiliated with The Danish Centre for Environmental Assessment (DCEA). In collaboration with the Inuit Circumpolar Council – Greenland, her research focuses on the use of Indigenous knowledge in environmental impact assessments in relation to extractive industries in Greenland.

A Greenlandic Inuk and part Swedish, Parnuna was born and raised in Nuuk, Greenland. She holds an MSc in biology with specialty in biological oceanography from the University of Southern Denmark in Odense. Prior to embarking on her PhD project, she worked as an advisor on environmental issues for the Inuit Circumpolar Council – Greenland for four years, working with Inuit interests and Indigenous Peoples' rights in an environmental context. In 2022, she became a special advisor for Oceans North Kalaallit Nunaat, working with science, communication, and campaigns in relation to healthy oceans and the sustainable use of marine living resources. Parnuna is married, has two small children, and lives in Køge, Denmark.

ENGLISH SUMMARY

This PhD thesis is the result of a collaboration between Aalborg University (AAU), Ilisimatusarfik – the University of Greenland, and the Inuit Circumpolar Council (ICC)–Greenland.

The main research question: **'How can Indigenous knowledge be effectively used as a resource in environmental impact assessments (EIA) in relation to extractive industries in Greenland?'** is divided into three sub-questions: exploring how different stakeholders conceptualise and perceive the knowledge of Indigenous Peoples; how Indigenous knowledge is currently integrated into EIA processes in relation to extractive industry activities in Greenland; and what the potentials are for improving the utilisation of Indigenous knowledge as a resource. To address these knowledge gaps the questions are explored through five papers in this article-based thesis.

The research explores knowledge concepts pertaining to the knowledge of Indigenous Peoples and examines how different stakeholders in Greenland and the Arctic conceptualise and perceive this knowledge. These knowledge concepts have different characteristics and should not be used interchangeably. There is an ongoing transition to Indigenous knowledge as the concept of choice, which is being led by Indigenous Peoples who advocate for it due to its implications for their rights. Despite its potential value, Indigenous knowledge is underutilised in current EIA processes, and has limited influence on the assessments. Scientific knowledge is the preferred source of information in Greenlandic EIA legislation. The lack of any formal recognition of Indigenous Peoples' rights and the principle of Free, Prior, and Informed Consent (FPIC) in legislation and processes pose another barrier. Through this research I have identified several opportunities for engaging Indigenous Peoples meaningfully in systematically and culturally appropriate ways to integrate their knowledge in different phases of EIA processes. Some of these opportunities require legislative amendments to align with international obligations regarding Indigenous Peoples' rights; and the development of community protocols to integrate Indigenous community expectations and concerns prior to EIA processes.

The research draws on fieldwork in Canada and Greenland involving qualitative interviews with stakeholders and participation in relevant projects. Methodologies include reviews and analysis of literature, legislation, and cases; qualitative semi-directed and directed interviews; and concept

mapping, with and without visualisations. The theoretical frameworks used for the research are the Constructivist strand of Informed Grounded Theory, and participant observation.

Overall, the PhD research contributes to understanding the challenges and potential benefits of utilising Indigenous knowledge in EIA processes, emphasising its role in improving the knowledge base for decision-making while supporting the meaningful engagement of Indigenous Peoples.

EQIKKAANEQ

Ph.d.-inngorniutigalugu allaaserisaq manna Aalborg Universitetip (AAU), Ilisimatusarfiup kiisalu Inuit Issittormiut Siunnersuisoqatigiiffiat (ICC) – Kalaallit Nunaata suleqatigiinnerisigut pivisunngorpoq.

Ilisimatusarnermi apeqqut pingaarneq: **'Kalaallit Nunaanni pisuussutinik qalluinermi Avatangiisinut Sunniutaasussanik Nalilersuinerni (ASN) nunat inoqqaavisa ilisimasaat sunniutilimmik qanoq atorluarneqarsinnaappat?'** soqutigisaqartut assigiinngitsut nunat inoqqaavisa ilisimasaat pillugit qanoq isiginneriaaseqarnerannik paasinnittarnerannillu misissuineq; Kalaallit Nunaanni aatsitassarsiornermik ingerlataqartut suliaannut atatillugit ASN-inik ingerlataqarnermi nunat inoqqaavisa ilisimasaat qanoq ilaatinneqarpat; kiisalu nunap inoqqaavisa ilisimasaannik atorluaanerup pitsanngorsarneqarnissaanut periarfissat suuppat. Ilisimanngisat paasiniarlugit allaaserisat tunngavigalugit soraarummeerummi matumani saqqummersitat tallimat aqqutigalugit apeqqutit misissorneqarput.

Ilisimatusarninni nunap inoqqaavisa ilisimasaat pillugit ilisimasanut taaguutit misissorpakka kiisalu Kalaallit Nunaanni Issittumilu soqutigisaqartut assigiinngitsut ilisimasanik taakkuninnga qanoq isiginnittaaseqarlutillu paasinnittarnersut misissorlugit. Ilisimasanut taaguutit taakku assigiinngitsunik pissuseqarput iluarisaannarmillu atugassaanatik. Nunat inoqqaavinit aqunneqartumik, pisinnaatitaaffigisanut pissusissamisoortumik sunniuteqarnera pissutigalugu, nunat inoqqaavisa ilisimasaannik toqqaasarneq atugaanerujartorpoq. Nunat inoqqaavisa ilisimasaat iluaqutaasinnaagaluartut ASN-inik ingerlataqarnerni atorneqarnerat annikitsuinnaavoq, naliliinernullu killilimmik sunniuteqarlutik. ASN pillugu inatsisini ilisimatuussutsikkut ilisimasat paasissutissanik pissarsivissatut salliunneqartarput. Nunat inoqqaavisa pisinnaatitaaffiinik kiisalu inatsisini sulianillu ingerlatsinerni killeqanngitsumik, sioqqutsilluni ilisimannittumillu akuersineq (FPIC) pillugit tunngavinnik pisortatigoortumik akuersisoqannginnera aamma aporfiuvoq. Ilisimatusarneq manna aqqutigalugu ASN-inik ingerlatsinerni killiffinni assigiinngitsuni nunat inoqqaavisa ilisimasaat aaqqissuussamik kulturikkullu naleqquttumik ilaatinnissaannut nunat inoqqaavisa isumalimmik peqataatinneqarsinnaanerannut periarfissat assigiinngitsut paasivakka. Periarfissat ilaat taakku nunat inoqqaavisa pisinnaatitaaffii pillugit nunani tamalaani pisussaaffinnut naleqqussarniarlugit inatsisinik

allannguisoqartariaqarpoq; kiisalu ASN sioqqullugit nunat inoqqaavisa naatsorsuutigisaat ernumassutaallu ilaatilerniarlugit inuiaqatigiinni suleriaasissanik ineriartortitsisoqassaaq.

Ilisimatusarnermi aallaavigineqarput Canadami Kalaallillu Nunaannilu misissuisarnerit, taakkunani soqutigisaqartunik apersuinerit suliniutini attuumassuteqartuni peqataaneq ingerlanneqarlutik. Periaatsinut ilaapput allagaatinik, inatsisinik sulianillu misissuisarnerit misissueqqissaarnerillu; aaqqissukannikkanik aaqqissukkanillu pitsaassusilimmik apersuinerit; kiisalu paasisanik nalunaarsuinerit, takussutissiinertalinnik takussutissiinertaqanngitsunillu. Ilisimatusarnermi teorii sinaakkutarineqartoq tassaavoq Informed Grounded Theory-p aaqqissugaanermut tunngasortaa aamma peqataasunik malinnaaneq.

Ataatsimut isigalugu ph.d.-nngorniutigalugu ilisimatusarneq ASN-inik suliaqarnerni nunat inoqqaavisa ilisimasaannik atorluaanermi qaangerniagassat iluaqutaasinnaasullu paasinissaannut iluaqutaassaaq, tamanna aalajangiinerni ilisimasat tunngavigineqartut pitsanngorsarnissaannut erseqqissaammat, nunallu inoqqaavisa isumalimmik peqataatinneqarnissaannut tapersersuilluni.

DANSK RESUMÉ

Denne ph.d.-afhandling er resultatet af et samarbejde mellem Aalborg Universitet (AAU), Ilisimatusarfik – Grønlands Universitet og Inuit Circumpolar Council (ICC)–Grønland.

Det overordnede forskningsspørgsmål: **'Hvordan kan oprindelige folks viden bruges effektivt som en ressource i Vurdering af Virkninger på Miljøet (VVM) i forhold til udvindingsindustrien i Grønland?'** er opdelt i tre underspørgsmål: undersøgelse af hvordan forskellige interessenter konceptualiserer og opfatter viden af oprindelige folk; hvordan oprindelig viden er integreret for nuværende i VVM-processer i forhold til udvindingsindustriens aktiviteter i Grønland; og hvad potentialerne er for at forbedre udnyttelsen af oprindelig viden som en ressource. For at udfylde disse videnshuller, udforskes spørgsmålene gennem fem publikationer i denne artikelbaserede afhandling.

Igennem min forskning udforsker jeg vidensbegreber vedrørende viden af oprindelige folk, og undersøger hvordan forskellige interessenter i Grønland og Arktis konceptualiserer og opfatter denne viden. Disse vidensbegreber har forskellige karakteristika og bør ikke bruges i flæng. Der er en løbende overgang til valget af oprindelig viden som det foretrukne koncept, som er ledet af oprindelige folk, der går ind for det på grund af dets implikationer for deres rettigheder. Trods dens potentielle værdi er oprindelig viden underudnyttet i nuværende VVM-processer, og har begrænset indflydelse på vurderingerne. Videnskabelig viden er den foretrukne informationskilde i den grønlandske VVM-lovgivning. Manglen på enhver formel anerkendelse af oprindelige folks rettigheder og princippet om frit, forudgående og informeret samtykke (FPIC) i lovgivning og processer udgør en anden barriere. Gennem denne forskning identificerede jeg flere muligheder for at engagere oprindelige folk meningsfuldt på systematisk og kulturelt passende måder for at integrere deres viden i forskellige faser af VVM-processer. Nogle af disse muligheder kræver lovændringer for at tilpasse sig internationale forpligtelser vedrørende oprindelige folks rettigheder; og udvikling af samfundsprotokoller til at integrere oprindelige samfunds forventninger og bekymringer forud for VVM-processer.

Forskningen trækker på feltarbejde i Canada og Grønland, der involverer kvalitative interviews med interessenter og deltagelse i relevante projekter. Metoder omfatter gennemgange og analyser af litteratur, lovgivning og sager;

kvalitative semi-strukturerede og strukturerede interviews; og konceptkortlægning, med og uden visualiseringer. De teoretiske rammer, der anvendes til forskningen, er den konstruktivistiske del af Informed Grounded Theory og participant observation.

Samlet set bidrager ph.d.-forskningen til at forstå udfordringerne og potentielle fordele ved at udnytte oprindelig viden i VVM-processer, idet det understreger dens rolle i at forbedre vidensgrundlaget for beslutningstagning, og samtidig understøtte et meningsfuldt engagement af oprindelige folk.

ACKNOWLEDGEMENTS

Writing this PhD thesis has been challenging, lengthy, and hair-pulling – while simultaneously thought-provoking, nuancing, and rewarding. The idea first emerged in collaboration with my primary supervisor, Anne Merrild Hansen, who had been nudging me to work with her for a while. With guidance from ICC–Greenland and support from my co-supervisor, Mark Nuttall, this PhD project became a reality in partnership between Aalborg University, ICC–Greenland, and Ilimisatusarfik – University of Greenland. Later, an opportunity to collaborate with the Arctic Research Centre (ARC) at Aarhus University led to the designation of my supplementary co-supervisor, Pelle Tejsner. I am deeply grateful to all my supervisors and backers for their support and for helping me grow as a researcher.

My deepest gratitude goes to my beloved partner Rasmus, who became my husband during this project. His dedicated support on the family front, his patience, and loving kicks in the butt kept me grounded. During this project, I also became pregnant and gave birth to my son, Sebastian Nanoq and my daughter, Vera Nivikka. They provide me with so much love and meaning – as well as sleep deprivation. I am thankful for the inspiration and fruitful discussions with my ICC colleagues in Greenland, Canada, and Alaska. Especially Carolina Behe and Vernae Angnaboogok for their valuable feedback on Inuit perspectives and Indigenous Peoples' rights. I also appreciate the contributions from my time at the Arctic EIA project editorial board regarding the meaningful engagement of Indigenous Peoples and EIAs in the Arctic – I still wear my Finnish socks. Another valuable contribution came from my participation in the UArctic PhD course on '*Sustainability, extractives industries, communities and social responsibility: Greenland and beyond*' in Sisimiut, 2017, which further shaped my ideas and provided the title for the thesis. Thanks to my former colleagues and PhD fellows at Aalborg University, Ilisimatusarfik, and ARC for their professional inspiration and social company. Especially my PhD fellows for their solidarity, writing-snack sessions, and sharing of jokes, advice, and the frustrations of everyday #phdlife. Finally, heartfelt thanks to my colleagues at Oceans North Kalaallit Nunaat for allowing me the work breaks to complete my thesis.

Qujanaq – Thank you.

Parnuna Petrina Egede Dahl
Køge, July 2024

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LIST OF ABBREVIATIONS

AAU	Aalborg University
AEPS	Arctic Environmental Protection Strategy
AEWC	Alaska Eskimo Whaling Commission
ARC	Arctic Research Centre
CSO	Civil Society Organisation
EAMRA	Environmental Agency for Mineral Resource Activities
EIA	Environmental Impact Assessment
FPIC	Free, Prior, and Informed Consent
GT	Grounded Theory
IA	Impact Assessment
IAIA	International Association of Impact Assessment
ICC	Inuit Circumpolar Council
ILO	International Labour Organization
ILO C169	Indigenous and Tribal Peoples Convention 1989 No. 169
IWC	International Whaling Commission
MLSA	Mineral License and Safety Authority
NGO	Non-Governmental Organisation
PhD	Doctor of Philosophy
SIA	Social Impact Assessment
UArctic	University of the Arctic
UN	United Nations
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNPFII	UN Permanent Forum on Indigenous Issues

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CHAPTER 1. INTRODUCTION

This chapter introduces the key challenges and concepts that constitute the rationale and the underlying motivation to initiate the research. Subsequently, the research objective and questions of the thesis are outlined, followed by a structural overview of how the thesis is organised.

WHY should scientists, practitioners, and decision-makers even consider Indigenous knowledge? What value can Indigenous knowledge bring to the environmental impact assessments (EIAs) of extractive industry activities? An example from the related research field of resource management can shed light on this issue:

The subsistence harvest of bowhead whales is significant for Arctic Indigenous Peoples in northern Alaska in relation to food security and the exercise of cultural rights (*Albert 2001; Lefevre 2013*). In 1976–1977, scientists estimated the Bering–Chukchi–Beaufort–Seas bowhead whale stock to be critically low, despite Iñupiat hunters reporting that the stock was healthy and growing. The International Whaling Commission (IWC) responded to the low stock estimate by setting the subsistence harvest quota to zero. The sudden ban on subsistence harvesting in 1977 was enforced without consulting the hunters, which prompted them to establish the Alaska Eskimo Whaling Commission (AEWC) to represent the hunters in whale-related negotiations with United States federal agencies and the IWC. The stock estimate was based on visual sightings of passing whales in open water by observers standing on landfast ice at Point Barrow, supplemented by a small aerial survey. The Iñupiat hunters believed that the scientific stock estimate was far too low, and they criticised the research design. Based on their own experience and Indigenous knowledge passed down through generations, the hunters insisted that bowhead whales are not afraid of ice and can break small holes to breathe, and thus migrate in a broad front through open water and under sea ice. Hunters and scientists from a related research programme formed personal relationships that served as the basis for collaboration efforts to understand the source of discrepancy. With input from AEWC and local hunters (especially Harry Brower Sr.), the research design was modified to involve a passive acoustic technique using underwater hydrophones. This proved successful in locating vocalising whales, even under challenging ice and weather conditions. Scientists could now support the hunters' observations: that the bowhead whale stock was much larger than the scientists had estimated, and in fact increasing. Consequently, the

subsistence harvest ban was lifted. The process of independent stakeholder peer-review of research design and conflict resolution through AEWC has now been extended to engage industry participants in minimising the disturbance of whale migration and subsistence harvest by planned offshore oil and gas activities (*Shadian 2013*).

To answer the WHY: Indigenous knowledge can bring value in synergy with science by improving the research design, knowledge, and interpretation of results. In this PhD thesis, I therefore focus on the HOW and WHAT of using Indigenous knowledge in EIAs of extractive industry activities.

1.1. PROBLEM STATEMENT

The Government of Greenland (Naalakkersuisut) wishes to pursue socioeconomic development through industrial activities, including extracting mineral and hydrocarbon resources. The political consensus is that the mineral resources sector should be developed into a leading industry in an environmentally sustainable manner (*Naalakkersuisut 2020*). The government is promoting this industry with the objective to create revenue and jobs, thereby contributing positively to the socioeconomic development. With its mineral strategy for 2020–2024, Naalakkersuisut wishes to attract investors and extractive industry companies to develop activities in the Greenlandic mineral resources sector. This strategy includes measures aimed at establishing the optimal framework and strengthening the established platform to become attractive as a mining country for international investors (*Naalakkersuisut 2020*).

In Greenland, extractive industry companies wishing to develop a project are legally required to carry out an EIA and a Social Sustainability Assessment (used interchangeably with Social Impact Assessment (SIA)). The resulting EIA and SIA reports must be submitted for public consultation and receive Naalakkersuisut approval before a license for exploration or exploitation can be granted (*Naalakkersuisut 2009b*). This is in line with international practices, where governments use EIA reports as part of the basis for the decision-making process regarding project permits and requirements (*Koivurova & Lesser 2016*).

The EIA process aims at describing the environment in a baseline study by identifying and estimating the possible environmental impacts of the proposed project activities and addressing environmental concerns by

suggesting measures that avoid, reduce, or mitigate the adverse impacts (*AEPS 1997*). With this focus on prevention rather than reaction, EIAs work as proactive decision-making tools for developing better projects from the beginning and allow for public participation in the process. The data material used in such baseline studies is the foundation upon which impacts are identified and assessed, but data gaps are often found in the Arctic due to the extreme and unique conditions, such as remote and harsh environments, lack of infrastructure, and logistical challenges limiting scientific research and long-term data monitoring (*CAFF 2013*). To fill such gaps and provide more (and sometimes better) data that complement the scientific research, the knowledge of Indigenous Peoples can prove a valuable source of information (*Huntington 2000; Johnson 2016*).

As further explained in Chapter 2: *Setting the scene*, the Indigenous Peoples of the Arctic have intrinsic knowledge and understanding of the land, the sea, and the wildlife upon which they depend (*Huntington 1998; Berkes 1999*). Indigenous knowledge systems have their own contextual frameworks (*Stevenson 1996*) with methodologies and validation processes that are distinct from scientific knowledge (*Berkes 1999; Nadasdy 1999; Agrawal 2002*). With the growing recognition that the knowledge of Indigenous Peoples and scientific knowledge are separate but complimentary knowledge systems (*Tengö et al. 2014*), efforts at combining them may generate new knowledge to inform and improve decision-making processes (*Permanent Participants 2018*).

The acknowledgement that the knowledge of Indigenous Peoples is a valuable source of information in research and management issues has become apparent on the international level. For example, the International Association of Impact Assessment (IAIA) includes traditional knowledge and recognises Indigenous knowledge holders as relevant sources of expert knowledge in their Principles of Environmental Impact Assessment Best Practices (*IAIA 1999*). Moreover, the Arctic Council has emphasised in its declarations the importance of using traditional knowledge in its work, for example declarations 2013 and 2015 (*Arctic Council 1996–2017*), and the Arctic states have adopted a legally binding agreement on enhancing international Arctic scientific cooperation that promotes the use of traditional knowledge in research activities (*Arctic Council 2018*).

Despite political intentions to include the knowledge of Indigenous Peoples in research, management, and environmental issues, the Indigenous Peoples' organisations that are Permanent Participants in the Arctic Council still

criticise the extent and quality of engagement of Indigenous Peoples and the use of their knowledge in these processes, and they are calling for researchers to improve on these challenges (*Permanent Participants 2018*). Conversely, researchers may experience difficulties when assessing and applying such knowledge in practice (*Huntington 2000*), which made no easier by the confusion and misunderstanding over the multiple, related concepts used for the knowledge of Indigenous Peoples and the lack of consensus on how to define them (*Stevenson 1996; Berkes 1999; Huntington 2005*).

The Inuit Circumpolar Council (ICC) is an international Indigenous Peoples' organisation with status as a Permanent Participant in the Arctic Council, representing approximately 180,000 Inuit living in Greenland, Canada, Alaska, and Chukotka. ICC and the other Permanent Participants have a strong interest in promoting the application of Indigenous Peoples' knowledge for work done under the auspices of the Arctic Council and in other research contexts (*ICC 2016; Permanent Participants 2018*). The regional ICC office in Greenland (ICC–Greenland) has suggested that the use of such Indigenous knowledge is highly relevant to the development of EIA in the Greenlandic context (*pers. comm., H. Dahl, ICC–Greenland, March 1, 2015*).

The research presented in this PhD thesis is the result of a collaboration between Aalborg University (AAU), Ilisimatusarfik – the University of Greenland, and ICC–Greenland. Each of these partners has provided a different perspective on the research: the focus on EIA coming from AAU, focus on Arctic extractive industries from Ilisimatusarfik, and focus on Indigenous knowledge from ICC–Greenland. Working together, they created a strong starting point for investigating how Indigenous Peoples are engaged and how their knowledge is used when assessing environmental impacts from extractive industry activities in Greenland, as elaborated further in section 1.2 below.

1.2. RESEARCH OBJECTIVE AND QUESTIONS

The overarching objective of this PhD research is to explore the engagement of Indigenous Peoples and the use of their knowledge in assessing environmental impacts of extractive industries in Greenland. The research is based on two fundamental assumptions: that Indigenous knowledge is a valuable resource that can add value to EIAs; and that there is room for improvement in how Indigenous knowledge is integrated into such

assessments in Greenland. These assumptions are detailed further in Chapter 2: *Setting the scene*.

The research objective leads to the following main research question and sub-questions, which have evolved and been refined in a constant, reiterative dialogue with the findings as they emerged, and further nuanced through dialogue with reviewers during the process.

Main Research Question:
How can Indigenous knowledge be effectively used as a resource in EIAs in relation to extractive industries in Greenland?

Sub-Questions:
The main research question can be broken down into three sub-questions (SQ1–3) that explore various aspects of the research:

SQ1 – Conceptualisation and perception: How do different stakeholders in the Arctic conceptualise and perceive the knowledge of Indigenous Peoples?

SQ2 – Integration in EIA processes: How is Indigenous knowledge currently integrated into EIA processes in relation to extractive industry activities in Greenland?

SQ3 – Improving utilisation: What are the potentials of utilising Indigenous knowledge as a resource, and how can its utilisation be enhanced in EIA processes?

By exploring these questions to understand how the present management of mineral resources uses Indigenous knowledge in EIA processes in Greenland, the hope is that it can contribute added value and to the improvement of Greenlandic EIA regimes, enriching the Arctic understanding of the meaningful engagement of Indigenous Peoples in environmental decision-making.

1.3. STRUCTURE OF THE PHD THESIS

The outcome of the project in hand is an article-based thesis consisting of five peer-reviewed and published papers (*see Chapter 4: Summaries of papers, and Appendix C: Full papers*) together with introductory chapters discussing their coherence. The chapters connect the papers by providing context, a theoretical framework, methodologies, as well as synthesis and discussion of the findings in an attempt to answer how Indigenous knowledge can be used as a resource in EIAs in relation to extractive industries in Greenland. The findings are partly based on analyses of additional research materials that have not been incorporated (or only partly incorporated) into the papers. I have nevertheless chosen to include the analyses, since they contribute to answering the research question (*see additional analyses in Appendix A and B*).

The research process resulting in this thesis has been a combination of data collection through semi-directed qualitative interviews conducted during fieldwork in Greenland and Canada and on other occasions, together with participant observations gathered at workshops. These data, literature reviews, and case reviews have been analysed using a theoretical framework of Informed Grounded Theory (GT) based on the Constructivist strand of GT to develop the concept maps and models used in the findings. In addition, the thesis has been informed by other processes, such as participating in related projects and receiving feedback on published papers and when disseminating my research at conferences and other meetings. To provide an overview of all of the elements that have informed the thesis, the PhD thesis is envisioned as a sealskin on a drying frame (*see Figure 1.1*). On the left side of the frame, elements of data collection are represented, with data analysis at the top, related projects on the right side, and the dissemination of research at the bottom; all stretching the thesis into its current shape.

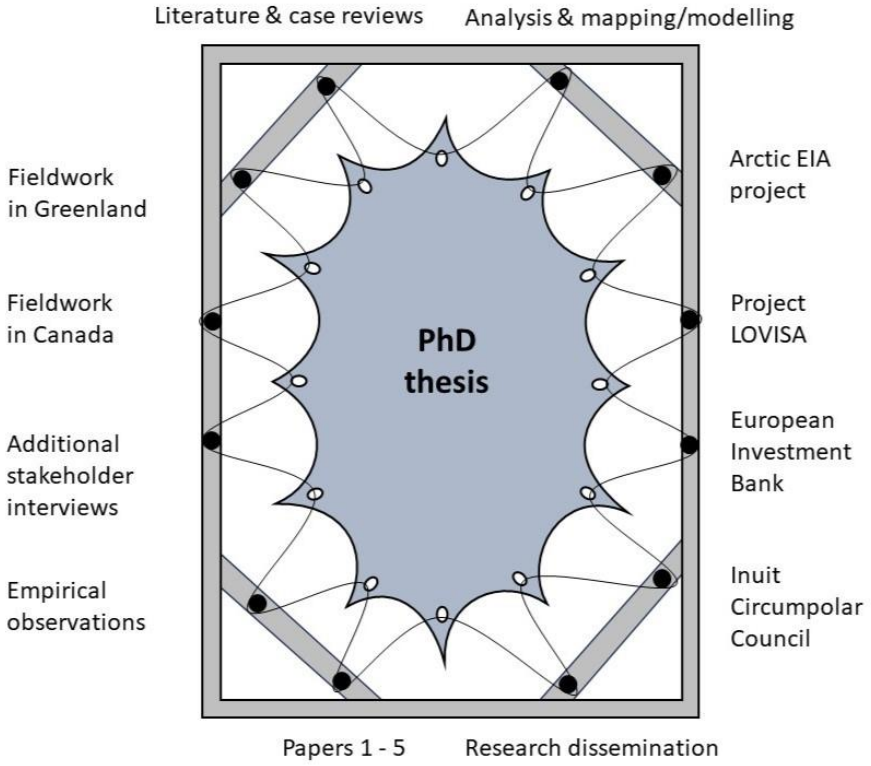

Figure 1.1: *A visual representation of the PhD thesis as a sealskin stretched on a drying frame with data collection (left), data analysis (top), related projects (right), and dissemination (bottom) along the frame.*

Each of the papers and additional analyses address different aspects of the sub-questions (SQ1–3), thereby helping to answer the main research question, as can be seen in Table 1.1 below and in further detail in Chapter 4: *Summaries of papers* and Chapter 5: *Synthesis, discussion, and conclusion.*

SQ1 is explored in Paper 1: *the Skills article*, Paper 2: *the Concept article*, Paper 3: *the White Paper article*, Paper 5: *the Pikialasorsuaq essay*, and in additional analyses. These papers investigate the various knowledge concepts and their differences, similarities, and associated challenges. Furthermore, they examine the stakeholders and their perceptions of knowledge concepts.

SQ2 is explored in Paper 1: *the Skills article*, Paper 3: *the White Paper article*, and in part Paper 4: *the Guidance note*, and in additional analyses. These papers identify arenas in which Indigenous knowledge is used or relevant to

use in EIA processes, examine how it influences the EIA process in specific cases, and discuss the challenges associated with its use in EIA processes.

SQ3 is explored in Paper 4: *the Guidance note*, Paper 5: *the Pikialasorsuaq essay*, and in additional analyses. These papers examine the lessons learned and best practices for the meaningful engagement of Indigenous Peoples and utilisation of their knowledge in EIA processes. They also identify areas for improvement for developers, researchers, practitioners, and decision-makers.

Table 1.1: *Overview of papers, additional analyses, and which sub-questions (SQ) they address.*

Papers	**SQ1**	**SQ2**	**SQ3**
Paper 1: Anne Merrild Hansen, Pelle Tejsner & Parnuna Egede (2016). *Traditional Knowledge and Industrial Development: On the Potential Use of Indigenous and Local Knowledge as a Resource to Assess Competencies in Greenland* **(referred to as the Skills article)**	Yes	Yes	No
Paper 2: Parnuna Egede Dahl & Pelle Tejsner (2020). *Review and Mapping of Indigenous Knowledge Concepts in the Arctic* **(referred to as the Concept article)**	Yes	No	No
Paper 3: Parnuna Petrina Egede Dahl & Anne Merrild Hansen (2019). *Does Indigenous Knowledge Occur in and Influence Impact Assessment Reports? Exploring Consultation Remarks in Three Cases of Mining Projects in Greenland* **(referred to as the White Paper article)**	Yes	Yes	No
Paper 4: Sanne Vammen Larsen, Anne Merrild Hansen, Parnuna Egede Dahl & Alberto Huerta Morales (2019). *Guidance Note on Indigenous and Local Community Participation in Environmental Impact Assessment in the European Arctic* **(referred to as the Guidance note)**	No	Yes	Yes
Paper 5: Clive Tesar, Parnuna Egede Dahl & Claudio Aporta (2019). *Picturing Pikialasorsuaq: Ethics & Effectiveness of Representing Inuit Knowledge in an Online Atlas* **(referred to as the Pikialasorsuaq essay)**	Yes	No	Yes
Additional analyses	Yes	Yes	Yes

READING GUIDE

The PhD thesis comprises five chapters:

- **Chapter 1:** *Introduction* outlines the problem statement together with the research objective and questions.
- **Chapter 2:** *Setting the scene* goes through the concepts, state of the art, and knowledge gaps in the research field.
- **Chapter 3:** *Theoretical framework and methodology* goes through the theoretical framework and methodologies, including reflections on the researcher role.
- **Chapter 4:** *Summaries of papers* provides an overview of each paper and its findings.
- **Chapter 5:** *Synthesis, discussion, and conclusion* explores the key findings in relation to the research questions, including perspectivation and contribution to the research field.
- **Appendices:** Additional analyses as well as the full version of the papers can be read here.

Chapters 1 and 5 can be read independently of the rest of the thesis and still allow for gaining an overview of the PhD research. When reading the chapters of this PhD thesis, some overlap and repetition between the chapters and papers must be expected due to the requirement that the papers be able to stand alone.

CHAPTER 2. SETTING THE SCENE

In this chapter, essential concepts regarding Indigenous Peoples, Indigenous knowledge, and Environmental Impact Assessments (EIA) are presented, which are necessary for understanding the research presented in this thesis. These concepts are subsequently contextualised in relation to mineral extraction in Greenland, explaining how the thesis contributes to the existing knowledge in the domain.

2.1. INDIGENOUS PEOPLES, RIGHTS, AND KNOWLEDGE

According to the United Nations (UN) and International Labour Organization (ILO), there are estimated to be roughly 476.6 million Indigenous Peoples (or 6.2% of the world's population) globally, spread across some 90 countries (*UN 2009; ILO 2019*). In the Arctic alone, the Arctic Council estimates that roughly 1 in 10 inhabitants has Indigenous origins, corresponding to roughly 500,000 inhabitants[1]. The term '*Indigenous Peoples*' (including the -s to indicate a plural form of people, a distinct group) is well referenced in international soft and hard law documents related to Indigenous rights and issues, such as the UN Declaration on the Rights of Indigenous Peoples and publications by organisations like the ILO, the UN Educational, Scientific and Cultural Organization[2], as well as in texts from Indigenous Peoples' organisations and Indigenous rights advocacy groups.

DEFINITIONS OF INDIGENOUS PEOPLES

There is no single, universally adopted official definition of Indigenous Peoples. Several articles have offered their own definitions, typically referring to distinct ethnic groups and communities with historical ties to a particular land or region, who are often the original or earliest inhabitants of that area, also sometimes with a history of colonisation (*see e.g., Alfred & Corntassel 2005; Sissons 2005; Canessa 2007; Wiessner 2023*). These peoples are typically characterised by their unique cultural, social, and often spiritual practices, as well as their strong connection to and dependence on the natural environment in which they reside. Within the UN system, there is

[1] Website of Arctic Council Permanent Participants: *https://arctic-council.org/about/permanent-participants/*

[2] Website of UNESCO: *https://www.unesco.org/en/indigenous-peoples*

no consensus on one single definition, as it has been deemed '*neither desirable nor necessary*' by Indigenous Peoples and states during years of negotiations (*UN 2009*). Still, one example within the UN system comes from the UN Permanent Forum on Indigenous Issues (UNPFII), which during its fifth session held at the UN Headquarters in New York in 2006 adopted a publication on '*Indigenous Peoples and Identity: Factsheet 1'* in which Indigenous Peoples are defined as (*UNPFII 2006*):

> *'… the descendants – according to a common definition – of those who inhabited a country or a geographical region at the time when people of different cultures or ethnic origins arrived. The new arrivals later became dominant through conquest, occupation, settlement or other means.'*

In other parts of the UN system, instead of defining Indigenous Peoples, the UN aims merely to identify them and has developed an understanding of the term based on a set of common criteria (*Mosyakin 2023*), which include:

- **Self-identification:** Indigenous Peoples self-identify as such at the individual level and are accepted as members of their respective communities.

- **Historical continuity:** They have a historical continuity with pre-colonial and/or pre-settler societies in their respective regions.

- **Strong connection to territories and natural resources:** Indigenous Peoples have a strong and often spiritual connection to their traditional lands and the natural resources within those territories.

- **Distinct social, economic, or political systems:** They may have distinct social, economic, or political systems that differ from those of the dominant or non-Indigenous societies in their regions.

- **Distinct language, culture, and beliefs:** Indigenous Peoples often possess their own languages, cultures, and belief systems that set them apart from other ethnic groups.

- **Non-dominant groups:** Indigenous Peoples typically form non-dominant groups within the larger societies in which they live, often

having experienced or continuing to experience marginalisation and discrimination.

- **Desire to maintain ancestral environments and systems:** Indigenous Peoples are often characterised by their resolve to maintain and reproduce their ancestral environments and cultural systems as distinctive peoples and communities.

These criteria are not meant to be rigid or prescriptive but serve as a framework to help recognise and understand the diverse experiences and identities of Indigenous Peoples worldwide. The specific application of these criteria can vary from one region or country to another, recognising that Indigenous Peoples' circumstances and histories differ significantly. References to Indigenous Peoples in this thesis are in accordance with the understanding provided by the common criteria provided above.

INDIGENOUS PEOPLES' RIGHTS

Indigenous Peoples' rights are special collective rights that encompass a range of fundamental principles and protections rooted in international law and human rights norms (*Reyes-García et al. 2022*). These rights acknowledge the unique cultural, social, and historical identities of Indigenous communities worldwide. Key elements of Indigenous Peoples' rights include the right to self-determination, which grants them the authority to make decisions about their own affairs and development; the right to land and resources, recognising their ancestral connections to traditional territories; the right to maintain and promote their distinct languages, cultures, and traditions; and the right to meaningful consultation and consent in the matters affecting them (*Cambou 2019*). The recognition and protection of Indigenous Peoples' rights are essential steps towards addressing historical injustices, promoting equality, and fostering sustainable development while respecting the diverse identities and aspirations of Indigenous communities (*Tsosie 2007; Mitchell et al. 2019*).

The rights of Indigenous Peoples are described in two major international agreements: The ILO Indigenous and Tribal Peoples Convention 1989 No. 169, (also known as ILO C169), which is a legally binding agreement (*ILO 1987*), and the UN Declaration on the Rights of Indigenous Peoples (also known as UNDRIP), which is a non-legally binding and aspirational declaration (*UNDRIP 2007*). Although ILO C169 and UNDRIP cover many

of the same issues, they have different emphases on certain aspects and are considered complementary and mutually reinforcing (*Candelaria 2012; APF & OHCHR 2013; Hochman & Weller 2018*). An essential component of the rights of Indigenous Peoples revolves around the principle of obtaining Free, Prior, and Informed Consent (FPIC) (*Mitchell et al. 2019*). This principle originally emerged in ILO C169 and was later clarified and strengthened in UNDRIP. In brief, the FPIC principle grants Indigenous Peoples '*the right to be consulted and make decisions on any matter that may affect their rights freely, without pressure, having all the information and before anything happens*' (*UNICEF 2013:12*). The definition of FPIC is further elaborated by the UN Food and Agriculture Organization (*FAO 2016*). In summary, 'Free' denotes an independent decision-making process without any form of pressure, intimidation, or manipulation; 'Prior' signifies that consent is sought well in advance of commencing activities; 'Informed' means that the provided information is comprehensive in all respects; and 'Consent' entails a collective decision reached through the affected Indigenous Peoples' own decision-making processes.

While a contentious debate continues among interest organisations as to whether FPIC grants Indigenous Peoples the authority to veto projects, it is crucial to underscore that FPIC primarily seeks to establish a robust consultation and active participation process for Indigenous communities. Some argue that FPIC becomes hollow if it does not include the right to refuse. This debate even extends to international organisations like the UN; for instance, in 2008 the UN Department of Economic and Social Affairs observed that, in most countries, neither Indigenous Peoples nor any other demographic group possess an explicit right to veto the development projects affecting them (*UNDESA 2008*). In contrast, in 2013 the UN collaborative initiative on Reducing Emissions from Deforestation and forest Degradation Programme stated that consent is '*A freely given decision that may be a "Yes" or a "No," including the option to reconsider if the proposed activities change or if new information relevant to the proposed activities emerges*' (*UN-REDD 2013:20*). These diverging perspectives within the UN underscore the complexity of the issue.

INDIGENOUS KNOWLEDGE

Indigenous Peoples possess a variety of knowledge systems encompassing the accumulated knowledge, beliefs, values, practices, and teachings that have been passed down for generations through cultural traditions (*Marques et al. 2021*). The Indigenous knowledge systems are holistic and encompass insights and understandings of the world that are deeply rooted in their intrinsic relationship with the natural environment (*Berkes 1999; Huntington 1998; Bravo 2010*) and their way of living (*McGregor 2004*). Some argue that these knowledge systems are grounded in worldviews with contextual frameworks distinct from scientific knowledge, and they are characterised by their own social, cultural, and philosophical dimensions (*Stevenson 1996*) as well as their own methodologies and validation processes (*Berkes 1999; Nadasdy 1999; Agrawal 2002*). Others argue that, regardless of their substantive, methodological, or contextual differences, the knowledge systems cannot be distinctly separated when examined in detail (*Agrawal 1995*).

Various concepts and terms have been used to label these Indigenous knowledge systems, the most common being 'traditional knowledge' (e.g. *Huntington 2005*), 'traditional ecological knowledge' (e.g. *Wenzel 1999; Usher 2000*), 'Indigenous knowledge' (e.g. *Stevenson 1996*), and 'local knowledge' (*e.g. Sejersen 1998*). An issue that adds complexity to the use of knowledge concepts is the tendency for various groups and different countries to use them interchangeably, reflecting divergent understandings regarding their meaning and scope. Moreover, as there are no internationally agreed definitions of each knowledge concept (*Berkes 1999; Huntington 2005*), the absence of consensus and interchangeability of related concepts create disagreement and confusion regarding their similarities, differences, and implications. This is further elaborated upon in Paper 2: *the Concept article*, which is included in this thesis (*see Appendix C*). The paper finds that the choices of concepts are shaped by different colonial and political-economic processes and that there are transitions in the preferred concepts over time.

Some view the knowledge of Indigenous Peoples to be different but complementary to scientific knowledge (*Huntington 2000; Stephens 2000:11*), possibly improving the knowledge base for decision-making processes when combined appropriately with each other (*Permanent Participants 2018*). Within research and resource management, acknowledgement of the importance of Indigenous Peoples' knowledge is growing (*Tengö et al. 2014*), and it extends to both professional and political

levels. Two best-practice documents, the '*Principles of Environmental Impact Assessment Best Practices*' (*IAIA 1999*) and the '*Respecting Indigenous Peoples and Traditional Knowledge*' (*Croal et al. 2012*), both reference traditional knowledge and recognise Indigenous Peoples as not only relevant but *imperative* sources of expertise. Another example worth noting can be found within the Arctic Council, an intergovernmental forum consisting of the eight Arctic states alongside six Permanent Participants representing Arctic Indigenous Peoples' organisations. In several of its declarations, the Arctic Council has underscored the critical role of incorporating traditional knowledge into its work, emphasising its indispensable contribution to a sustainable future in the Arctic; for example, in declarations 2013 and 2015 (*Arctic Council 1996–2017*). In May 2018, the Arctic states ratified a legally binding agreement aimed at enhancing international Arctic scientific cooperation. This agreement commits the Arctic states to actively promote the integration of traditional and local knowledge into their research activities. Moreover, it encourages enhanced dialogue between traditional and local knowledge holders and researchers, urging traditional and local knowledge holders to engage actively in scientific activities (*Arctic Council 2018*).

Even with political aspirations to include Indigenous Peoples' knowledge in research and resource management, the level and quality of the engagement in these processes is varying at best. The Permanent Participants in the Arctic Council continue to call for scientists to engage with Indigenous Peoples meaningfully in collaborative knowledge production to address knowledge gaps in the Arctic regions (*Permanent Participants 2018*).

The understanding of the knowledge of Indigenous Peoples in this thesis is based on the Inuit Circumpolar Council definition of Indigenous knowledge (*ICC 2016:1*) as:

> *'A systematic way of thinking applied to phenomena across biological, physical, cultural and spiritual systems. It includes insights based on evidence acquired through direct and long-term experiences and extensive and multigenerational observations, lessons and skills. It has developed over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation.'*

INDIGENOUS PEOPLES AND RIGHTS IN GREENLAND

Part of the Kingdom of Denmark, Greenland is a semi-autonomous territory with its own Home Rule since 1979 and Self-Government since 2009. The Act on Greenland Self-Government (*Naalakkersuisut 2009a*) recognises that '*the people of Greenland is a people pursuant to international law with the right of self-determination*'. This makes the Greenland Government a democratically elected public government, and not an Indigenous government as such (*UNHRC 2011*). Nevertheless, most modern Greenlanders are Indigenous Inuit descending from the Thule culture settling into the whole of Greenland from the 12th century (*Raghavan et al. 2014*), with a second wave of Thule Inuit (self-identifying as Inughuit) settling in northwest Greenland in the 17th century (*Moltke et al. 2015*). In the period that Greenland was colonised by Denmark, the Inughuit in northern Greenland and the Inuit in eastern Greenland were colonised last, and they retained such distinct cultural traditions and dialects that they would have been termed separate Indigenous Peoples in other contexts (*Johnstone 2019*). Nonetheless, the Kalaallit, including the minorities of Inughuit and East Greenlanders, are politically considered to be a single Indigenous Peoples (*ILO 2001*) and thus considered the only Indigenous Peoples in the Kingdom of Denmark (*UNHRC 2011*), although this view is increasingly being challenged in the UN system (*Johnstone 2019*).

As described above in section 2.1 on Indigenous Peoples' rights, the ILO C169 is a global, legally binding agreement, whereas the UNDRIP is a non-legally binding and aspirational declaration. Denmark ratified the ILO C169 in 1996 at the request of Greenland and with a practice of submitting joint reports (*UNHRC 2011*). Denmark also adopted the UNDRIP in 2007, and the Greenland Government strongly endorses UNDRIP. In its postcolonial relationship with the Indigenous Peoples of Greenland, the Danish Government considers the establishment of the Greenland Self-Government arrangement to be an example of its fulfilment of the right to decolonisation and self-determination for the Greenland Inuit, as UNDRIP lays out (*Cambou 2020*).

As for the relationship between Naalakkersuisut and its own population, Cambou (*2020*) notes how there are two types of rights that overlap substantially: The right to internal self-determination as a part of fundamental human rights on an individual citizen level; and the special collective right of the Greenland Inuit as an Indigenous Peoples to self-determination. The Greenland Government formally recognises the Greenland Inuit as an

Indigenous Peoples and states that it endeavours to implement relevant provisions of ILO C169 and UNDRIP in its inner workings and to observe the rights of Indigenous Peoples within its own jurisdiction. Despite this stated intention, the Act on Greenland Self-Government contains no language relating to Indigenous Peoples (*Naalakkersuisut 2009a; Cambou 2020*). Balancing these rights is posing a challenge for the Government, and the Inuit Circumpolar Council – Greenland still argues that Naalakkersuisut needed to improve the implementation of Indigenous Peoples' rights internally, especially using the principle of FPIC as a tool for a more participatory democracy that considers Inuit values and culture (*pers. comm., A. Lynge, Inuit Circumpolar Council, September 18, 2018; Johnston 2019*).

INDIGENEITY IN GREENLAND

Greenlandic Inuit call themselves 'Kalaallit', meaning Greenlander, and their word for Greenland is 'Kalaallit Nunaat', meaning the Land of the Greenlanders. However, the collective identity discourses in the public debate reveal Greenlandic self-identification to be a complex and multi-faceted matter (*Thomsen 2021*), similar to what is observed in other parts of the world (*Canessa 2007*). The latest vandalisation of the Hans Egede[3] statue in Nuuk with red paint and the word 'DECOLONIZE' in 2020 (*Sermitsiaq 2020a*) triggered heated debate about the remnants of Greenland's history of colonisation. The debate could give the impression that it was a generational divide between the 'woke' decolonisation movement led by young people versus a conservative Christian generation of older people, although it is not as simple as that. Later the same year, political debate was initiated about what it means to be Greenlandic (*Sermitsiaq 2020b*), which led to further political discussion in 2022 about creating an 'Inuit registry' regarding a potential future referendum on Greenlandic independence (*Sermitsiaq 2022*). These debates revealed a much more complex picture of the ongoing nation-building and identity-building process, with a broad continuum of identities ranging from civic nationalism (citizens of a nation with shared values) to ethnic nationalism (citizens of Inuit descent and shared cultural heritage and language) (*Thomsen 2022*). There are even examples of pan-Arctic and pan-Inuit identities, especially fostered by events such as the Arctic Winter Games and the general assemblies of the Inuit Circumpolar Council (*Thomsen et al. 2018*).

[3] Hans Egede was a Danish-Norwegian priest, who is generally credited with having brought Christianity to Greenland.

The matter is complicated further by the cultural and genetic mixing of Kalaallit with outsiders. The Kalaallit have been mixing with primarily Europeans to some degree since the 16th century, and the present-day Inuit genomes contain approximately 25% European ancestry (*Moltke et al. 2015*), about 91% of which stems from Danish ancestry in recent generations (*Waples et al. 2021*). Where a person lives may also play a role, as cities tend to have more foreigners compared to settlements, and some regions have experienced less cultural mixing (*Pereira et al. 2015*). This history of mixing and daily ethnic diversity may influence why some Greenlanders identify primarily as Inuit or Indigenous, while others prioritise a broader sense of Greenlandic identity and embrace cultural diversity.

On an international level, Greenland has not hesitated to draw on the Indigenous Peoples' rights whenever doing so has proven to be advantageous. Internally, though, the Greenlandic nation-building process has primarily been inspired by civic nationalism with a public rather than Indigenous government, as mentioned in the former section. Nevertheless, alongside the decolonisation movement the growing interest in revitalising or even re-inventing Inuit heritage and traditions in Greenlandic culture (*Körber & Volquardsen 2020; Inuit Art Quarterly 2023)* will continue to shape the future collective self-identification of Greenlanders.

2.2. ENVIRONMENTAL IMPACT ASSESSMENT

When planning and developing mineral resource activities in the Arctic, both onshore and offshore, extractive industries are required by law to undertake an Environmental Impact Assessment (EIA), which governments use as a basis for making decisions on permits and project requirements (*Koivurova & Lesser 2016*). An EIA is a systematic process used to evaluate the potential environmental consequences or impacts of proposed projects before they are carried out. The purpose of undertaking an EIA is to identify, predict, and assess the positive and negative effects that a project or activity may have on the environment and the well-being of both current and future generations (*AEPS 1997*). The requirement to undertake an EIA in relation to a new project is implemented in national legislations worldwide to promote sustainable development.

Key aspects of an EIA typically include:

- **Identification of impacts:** Determining what aspects of the environment might be affected by the proposed project, such as air quality, water resources, biodiversity, land use, and social aspects.

- **Impact prediction:** Estimating the magnitude and significance of potential impacts, considering factors like project size, location, and the sensitivity of the affected environment.

- **Mitigation measures:** Developing strategies to minimise, mitigate, or compensate for any negative impacts and to enhance positive impacts.

EIAs are typically conducted by a combination of parties, including government agencies, project developers from the extractive industry, and professional EIA practitioners. The responsibility for conducting an EIA typically falls on the project developer, but it is subject to oversight and review by government agencies and often involves input from environmental experts and the public to ensure a comprehensive and balanced assessment of potential environmental impacts.

Public participation is an essential aspect of many EIA processes. It allows local communities, advocacy groups, and other stakeholders to provide input, express concerns, and offer suggestions regarding the proposed project's environmental impacts. Public hearings, consultations, and feedback mechanisms are commonly used to facilitate this involvement. An EIA can thus work as a proactive decision-making tool to develop a better project from the start, according to the International Association of Impact Assessment (*IAIA 1999*). The role and function of public participation includes the securing of transparent processes, determination of potential areas of conflict, and creation of trust and mutual respect between decision-makers and the public. Public participation is thus expected to lead to a more democratic process. But public participation also holds a more practical function; namely, to secure that knowledge of relevance to a project is identified and included in the EIA.

MINERAL EXTRACTION AND IMPACT ASSESSMENT REGIMES IN GREENLAND

On 21 June 2009, the Greenland Self-Government Act came into effect. This granted Naalakkersuisut the authority to oversee mineral resources, allowing it to control the exploitation and revenue generation from both hydrocarbons and minerals found in Greenland's subsoil. As a result, Greenland adopted the Mineral Resources and Mineral Resource Activities Act (commonly known as the Mineral Resources Act) on 7 December 2009 (*Naalakkersuisut 2009b*). The Act includes provisions that govern the environmental and social impacts resulting from mineral resource activities (*Koivurova & Lesser 2016*).

The Ministry of Mineral Resources is the responsible authority, overseeing strategies and policies as well as legal aspects and socio-economic aspects of mineral resources. Within this Ministry, the Mineral License and Safety Authority (MLSA) plays a crucial role as a one-stop shop for project developers, administrating the SIA process and coordinating with other agencies to oversee licensing and any mineral resources activities. On the other hand, the Ministry of Environment is the responsible authority for environmental issues related to mineral resources activities. Within this ministry, the Environmental Agency for Mineral Resource Activities (EAMRA) is entrusted with administrating the EIA process, environmental liability, and protective measures for the environment and nature, in coordination with the MLSA. The Mineral Resources Act is establishing the legislative framework for conducting impact assessments and is further complemented by explanatory notes and official guidelines providing in-depth requirements for the preparation of EIA and SIA reports (*see Table 2.1 below*). Since it was adopted, the Mineral Resources Act and guidelines have been continuously developed and improved through several amendments, inspired in part by recommendations from non-governmental organisations, Indigenous Peoples' organisations, and individual citizens (*NGO Coalition 2014*).

Table 2.1: *Overview of EIA legislation related to mineral resources activities in Greenland.*

Year	Type	Title
2009	Act	*Greenland Parliament Act no. 7 of 7 December 2009 on mineral resources and mineral resource activities (Mineral Resources Act), including the following amendments and explanatory notes:* *• Greenland Parliament Act No. 26 of 18 December 2012* *• Greenland Parliament Act No. 6 of 8 June 2014* *• Greenland Parliament Act No. 16 of 3 June 2015* *• Greenland Parliament Act No. 34 of 28 November 2016* *• Greenland Parliament Act No. 16 of 27 November 2018* *• Greenland Parliament Act No. 39 of 28 November 2019* *• Greenland Parliament Act No. 27 of 13 June 2023*
2011	Guidelines – hydrocarbons	*BMP Guidelines – for preparing an Environmental Impact Assessment (EIA) report for activities related to hydrocarbon exploration and exploitation off shore Greenland*
2011	Guidelines – hydrocarbons	*BMP Guidelines – for preparing an Environmental Impact Assessment (EIA) report related to stratigraphic drilling offshore Greenland*
2015	Guidelines – hydrocarbons	*DCE/GINR/EAMRA, Offshore Seismic Surveys in Greenland – Guidelines to Best Environmental Practices, Environmental Impact Assessments and Environmental Mitigation Assessments*
2015	Guidelines – minerals	*Mineral Resources Authority, Guidelines for preparing an Environmental Impact Assessment (EIA) report for mineral exploitation in Greenland*
2016	Guidelines – minerals	*Naalakkersuisut, Social Impact Assessment (SIA) Guidelines on the process and preparation of the SIA report for mineral projects*

Provisions in the Mineral Resources Act (Part 15, section 73) require that any mineral resources activity assumed to have significant impacts on the environment can only be licensed if an EIA has been conducted and the following report approved by Naalakkersuisut. Activities that scientific advisors to the Government have determined to trigger an EIA process are mineral and hydrocarbon exploitation, including the phases of construction, operation, subsoil storage, energy use, and closure of activities and facilities. Moreover, activities such as seismic surveys and drilling programmes related to hydrocarbon exploration also trigger an EIA process. Likewise, other provisions of the Mineral Resources Act (Part 16, section 76) require that any mineral resources activity assumed to have significant impacts on social conditions can only be licensed if an SIA has been conducted and the following report approved by Naalakkersuisut. In practice, any mineral

resources activity (except for seismic surveys) triggering an EIA process will also trigger an SIA process (*pers. comm., O. Geertz-Hansen, Greenland Institute of Natural Resources, April 23, 2018*) with joint consultation processes. Other provisions (Sections 74 and 77) outline that the obligation to prepare impact assessment reports lies with the license applicant.

2.3. INDIGENOUS PEOPLES AND INDIGENOUS KNOWLEDGE IN EIA

Several documents establish how Indigenous Peoples should be approached in relation to projects that may affect their lands and resources. For example, the ILO C169 contains several articles on this matter: Article 6 establishes the duty of governments to consult the affected Indigenous Peoples, ensuring to enable them to participate freely in all levels of decision-making with the objective to achieve agreement or consent; Article 7 establishes the rights of Indigenous Peoples to decide their own priorities and participation in development on lands they occupy or otherwise use; and, finally, Article 15 establishes their right to participate in the use, management, and conservation of natural resources on their lands. As referred to in section 2.1 on Indigenous Peoples' rights, the UNDRIP Article 32 also establishes in detail the duty of states to consult Indigenous Peoples to obtain FPIC prior to the approval of projects that may affect their lands and resources. It also requests that states take measures to mitigate adverse impacts of such activities on environmental, economic, social, cultural, or spiritual matters, which transcends traditional EIAs.

Even though the rights of Indigenous Peoples are the domain of states in their respective relationships with the peoples within their state borders, the extractive industry is put in the position of having to deal with Indigenous Peoples' rights. As the previous section mentioned, the project developers are usually responsible for preparing the EIA report; either on their own or through consultants working as EIA practitioners before presenting them to the government for a decision. This means that, in effect, the instructions for consultation that governments have laid out in legislation and guidelines are in practice implemented by the industry. States that have ratified the ILO C169, adopted the UNDRIP, or have developed jurisprudence with similar principles may still experience challenges with the implementation from legislation to practice. If government requirements are low and reflect little on their obligations to consult with Indigenous Peoples, and the project

developer is only meeting the minimum standards, the obligation to consult may not be fulfilled in a satisfactory manner.

Alternatively, however, the project developer may raise the bar by adopting their own industry standards that are higher than requested. Sometimes investors even demand project developer compliance with certain international standards that exceed the government requirements. The industry has increasingly risen to the occasion and implemented the international agreements on Indigenous Peoples' rights by adapting industry standards that include language relating to those rights and agreements; for example, the World Bank Group International Finance Corporation and the International Council of Metals and Mining have both included FPIC as a good practice standard (*IFC 2012; ICMM 2013*), requesting their industry members to fulfil certain rights of Indigenous Peoples despite not being governments. According to the European Investment Bank's Standard 7 (*European Investment Bank 2022*), the ILO C169 and UNDRIP should be applied in the implementation of sustainable development projects at all levels, enabling the full participation of Indigenous Peoples through FPIC in decision-making regarding the policies, programmes, and projects affecting them.

Similarly, some consultants and EIA practitioners have taken it upon themselves to raise the bar for the implementation of Indigenous Peoples' rights in EIA processes. Within this field, it is generally acknowledged that effective public participation includes accessing Indigenous knowledge where relevant *(AEPS 1997; IAIA 1999; CBD 2004)*, and the IAIA has developed a more specific set of best practice principles relating to Indigenous Peoples and Traditional Knowledge (*Croal et al. 2012).* As seen with governments and project developers, EIA practitioners may also experience challenges with the implementation of these best practices, which is reflected in a statement by Indigenous Peoples inviting the impact assessment community to '*achieve the unrealised potential of fully participatory processes*' by applying principles regarding Indigenous Peoples' rights (*Aashukan Declaration 2017*).

One argument as to why it is so challenging to implement Indigenous Peoples' rights into EIA processes relates to the categorisation of Indigenous Peoples as stakeholders instead of rightsholders (*Sarkki et al. 2021*). Within EIA legislation, the term 'stakeholder' is used for individuals, groups, or organisations with an interest or concern about a given project; they can either be affected by or themselves affect the project and its related impacts. The

stakeholders in an EIA process will typically be government agencies, citizens residing near the project, and civil society organisations and interest organisations, such as employer or employee associations, Indigenous Peoples Organizations, and non-governmental organisations. From the perspective of Indigenous Peoples, however, it is the project developer who has the stake in the project and is, thus, the stakeholder. According to Sarkki et al. (*2021*), the rights of Indigenous Peoples risk being marginalised in the process, as stakeholder approaches are typically biased by their characteristics of all-inclusivity, the prioritisation of economic interests, and an ahistorical view on rights. By terming themselves as rightsholders, Indigenous Peoples distinguish themselves from other stakeholders, which requires the application of FPIC in a more thorough participation process in an EIA context.

INDIGENOUS KNOWLEDGE IN GREENLANDIC EIA

A review of the terminology used in the Mineral Resources Act and the official EIA guidelines (*see Appendix A*) reveals how the Greenlandic Inuit are viewed in terms of terminology and engagement. The Mineral Resources Act primarily employs terms like citizens, local authorities, and stakeholders, with scientific knowledge and 'expert knowledge' being the recognised sources of legitimate knowledge. The knowledge holders are engaged through expert consultations and public consultations.

The EIA guidelines for mineral exploitation in Greenland continues along the same lines as the Act, although adding more detailed terms for knowledge holders, such as traditional users, local hunters, and local fishermen. The guidelines employ knowledge concepts such as local knowledge and scientific knowledge, albeit with emphasis on the latter. The EIA guidelines for hydrocarbon projects also have a similar terminology regarding knowledge holders and their engagement as the Act, although the term local knowledge is absent and scientific knowledge alone is the only source of legitimate knowledge. Interestingly, the absence of a specific Indigenous terminology suggests a downplaying of Indigenous aspects, possibly reflecting the broader focus on public governance (*as mentioned above in the section on Indigeneity in Greenland*). For further insights, see Paper 3: *the White Paper article* (*Appendix C*), as well as the analysis of terminology in Greenlandic EIA legislation (*Appendix A*).

Even though the language on Indigenous Peoples is not reflected in the EIA legislation, arenas remain where Indigenous knowledge holders can be engaged and their knowledge used in the EIA process. As figure 2.1 below illustrates, the typical phases in EIA and SIA as they are conducted in Greenland are shown, including the phases in which stakeholder involvement occurs. Currently, there are two types of official public consultations in the EIA process: A 30-day public pre-hearing in the scoping phase and an 8-week public hearing in the EIA report review phase, including public meetings. During these hearings, anyone can submit oral and written consultation statements to Naalakkersuisut, which collects the comments in so-called white papers. The project developer will respond to the comments, often followed by a response from the scientific advisors to the government and subsequently followed by a government decision on whether the comments will lead to changes in the EIA report. A potential arena also exists in which stakeholder involvement can be arranged in the impact assessment phase, including impact prediction and mitigation, a topic described in greater detail in Paper 3: *the White Paper article* (*Appendix C*).

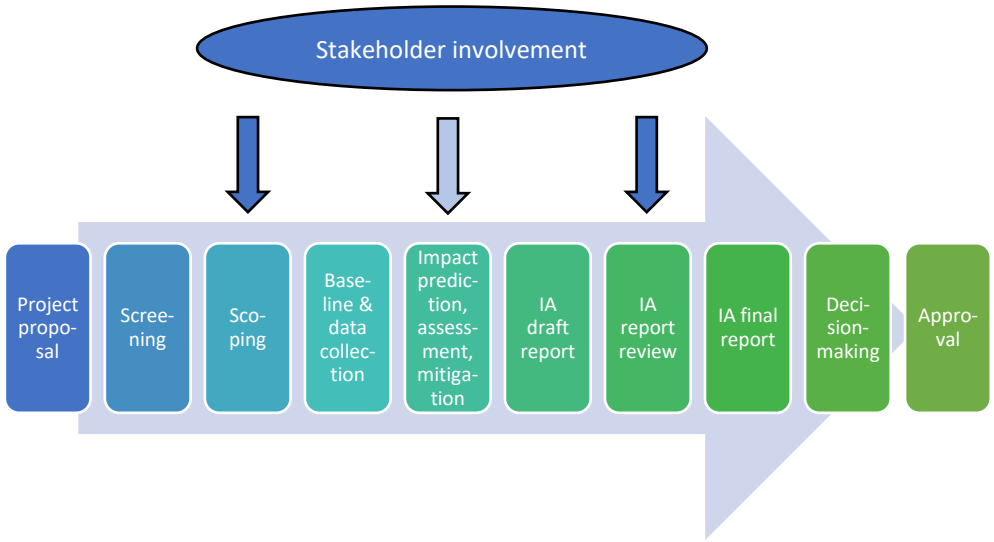

Figure 2.1: *Typical phases of environmental and social impact assessments, including phases where stakeholder involvement is commonly conducted in Greenland. Dark blue arrows indicate official public consultations, and the light blue arrow indicates potential stakeholder consultations (adapted from Paper 3: the White Paper article).*

2.4. THE STATE OF THE ART

While numerous studies have explored EIA processes; Indigenous knowledge concepts; mineral extraction activities; and the Greenlandic context, the intersection between these four research topics remains an understudied area with notable research gaps. Still, there is a body of existing literature on each of the four research topics or in combinations of two or more of these topics, as described in the next section.

EXISTING LITERATURE

Indigenous knowledge and EIA

Of the existing literature on Indigenous knowledge in EIA is the notable work by Stevenson (*1996*), who already in 1996 described and advocated for meaningfully involving Indigenous Peoples and incorporating their knowledge into EIA for the benefit of the Indigenous Peoples and industry alike. Stevenson pinpointed ways to involve Indigenous Peoples in three phases: identification, assessment, and mitigation, and the monitoring of the environmental and socioeconomic impacts of a project.

Grey literature and policy initiatives offer supplementary perspectives. In the course of the work on this PhD project, the Canadian Environmental Assessment Agency (*2017*) initiated and finalised a review of their federal EIA legislation, the aim of which included the better integration of Indigenous considerations into impact assessment processes. A panel made several recommendations on how to enhance Indigenous participation and consultation in all phases of IA, reflecting the UNDRIP principles and respect to continuously developing nation-to-nation relationships.

Another project that was initiated and finalised during this PhD project was the '*Arctic EIA Project*' under the auspices of the Sustainable Development Working Group of the Arctic Council between 2017 and 2019. The project, in which I also participated on behalf of the Inuit Circumpolar Council (*see Chapter 3.3 on Participant Observation*), contributed to a similar discourse on the meaningful engagement of Indigenous Peoples and the utilisation of their knowledge in Arctic EIA processes (*SDWG 2019*). The resulting report listed the various EIA regimes, five good practice recommendations, and featured 17 cases with examples of good practices from the Arctic regions, including two cases from Greenland. The report chose and created definitions

of knowledge concepts, which are elaborated on in Paper 2: *the Concept article (see Appendix C*).

Indigenous knowledge and mineral extraction activities

Despite considerable research on Indigenous knowledge in relation to the management of living resources in the Arctic, including Greenland, there is a notable lack of attention to Indigenous knowledge related to non-living resources, such as the extractive industry in Greenland. As Danielsen et al. (*2014:1*) stated about Greenland, '*Local fishers and hunters observe the environment all year-round. Their observations and knowledge are, however, not consistently quantified, analyzed, or used for resource management*'. And although they implied living resources, the same can be said about non-living resources.

A detailed example from other Arctic regions regarding the use of Indigenous knowledge in mineral extraction activities was seen in the case of the Ekati Diamond Mine in Canada (*BHP Billiton Diamonds Inc. 2006*). The mining company initiated the 'Caribou and Roads Traditional Knowledge Project' in 2002, in which Dene and Inuit elders collaborated with the company to apply their traditional knowledge concerning caribou behaviour. Their aim was to find visual and physical methods to deter the culturally important Bathurst caribou from entering the dangerous mining sites and airstrip, using traditional methods to direct caribou, such as setting up *inokhok* (human-shaped stone piles), snow fences, poles, and ropes, etc. The project included the monitoring of the effects on caribou migration over seasons, as well as adjusting and improving the design and placement of the deterrents. Although the project produced mixed results with respect to moving caribou away from the mining sites, it remains an example of active engagement with Indigenous knowledge holders.

EIA and mineral extraction in the Arctic and Greenland

Of notable works on EIA in the Arctic, the Arctic Environmental Protection Strategy (AEPS) provided the first guideline for Arctic EIAs to be officially agreed upon by all eight Arctic states (*AEPS 1997*). This document of best practices continues to lay the foundation for what can be considered the minimum standards to adhere to. This is also reflected in the book by Koivurova and Lesser (*2016*) on various EIA regulatory regimes in the Arctic regions, including Greenland, and their guide to best practice. Although the authors did interview Indigenous Peoples, the focus is more on stakeholder engagement in general. A more recent study, from Hansen, Larsen, and Noble (*2018*), has provided valuable insights in a chapter on how SIA and EIA are

implemented in the Arctic regarding extractive projects, as featured in *The Routledge Handbook of the Polar Regions*.

Of the existing literature on EIA regimes in Greenland, the current research is rather limited, albeit slightly larger if SIA regimes are included. A study by Mortensen and Hansen (*2013*) explains how the legal framework for SIA had been improved through amendments, although room remains for improvement. Another study by Hubbard (*2014*) states that FPIC is highly relevant for extractive industries in Greenland, analyses the SIA and EIA consultation processes, and demonstrates how they failed to implement FPIC in full, although EIA was slightly more in line with FPIC. A study by McDowell and Ford (*2014*) on the interconnected social and ecological aspects of former hydrocarbon activities in Greenland finds that the information on the potential risks, uncertainties, and environmental change in EIA and SIA reports was insufficient and underestimated, influencing the decision-making process with a bias on certainty. A recent paper by Larsen (*2021*) addressed the same underestimation of uncertainty, challenging the acknowledgment of uncertainty in EIAs, which were therefore often not systematically handled despite the tools to do so being available. Regarding the extraction of mineral and hydrocarbon resources in Greenland, a study by Mortensen (*2015*) noted how the mentioned activities were tightly tied to hopes for Greenlandic economic independence and thus political independence, echoing a point from Nuttall (*2012*) regarding mineral resource exploitation being a cornerstone of the Naalakkersuisut strategy. Although a study by Hansen et al. (*2016*) found that the Greenlandic population did not trust Naalakkersuisut to protect local values in these pursuits, suggesting that SIA could be applied on a policy level and incorporating the FPIC. Nuttall (*2012*) made note of similar concerns regarding the EIA process related to the proposed Isukasia mine in Greenland.

KNOWLEDGE GAPS

As illustrated in figure 2.2 below, there is a knowledge gap at the intersection between the four research topics: EIA processes – Indigenous knowledge concepts – mineral extraction activities – and the Greenlandic context.

Figure 2.2: *Illustration of the knowledge gap in the intersection between the research topics: EIA – Indigenous knowledge – mineral extraction – and the Greenlandic context.*

When it comes to specific knowledge and understanding of how the present management of mineral resources uses Indigenous knowledge in EIA processes in Greenland, the research topic remains rather unexplored. Additionally, the current EIA legislation in Greenland lacks a systematic approach to engaging Indigenous knowledge holders and incorporating and evaluating the degree of utilisation of Indigenous knowledge in the EIA process. This thesis aims to bridge the knowledge gap in Figure 2.2 and to create an understanding, leveraging the use of Indigenous knowledge as a resource that supplements scientific knowledge, especially in the context of mineral resource activities in Greenland. The hope is that this novel study will prove to be relevant and timely, as Indigenous Peoples' organisations such as the ICC have called for.

CHAPTER 3. THEORETICAL FRAMEWORK AND METHODOLOGY

This chapter outlines the research process and elaborates on the theoretical frameworks and methodologies. This includes the choice of theory, methods, and practical application for individual studies, as well as strengths and weaknesses. I then reflect on my role in the research process, including background and contextual factors that influence my positions, perspectives, and interactions.

3.1. THE RESEARCH PROCESS

With the support of my supervisor, I began the research process by identifying a possible problem and initial research questions that could address this problem. To shed light on the research question of how Indigenous knowledge can be used as a resource in EIAs in relation to extractive industries in Greenland, I conducted a literature review (*see section 3.3.1*). The initial literature review related to knowledge concepts of Indigenous Peoples and EIAs in the Arctic helped me to define terms and concepts and to identify the state of the art within the field. I identified knowledge gaps that helped to clarify the problem and to refine the research question, narrowing down the scope to Greenland.

After planning methods for data collection, I conducted two fieldwork trips to carry out interviews (see section 3.3.1). My first fieldwork involved a three-week trip to Montreal and Ottawa in Canada in 2017. I participated in the International Association of Impact Assessment (IAIA) Conference in Montreal on 4–7 April, where I had been invited to present my preliminary findings on '*Impact assessment approaches in Greenland*' as part of the panel debate '*Impact assessment approaches in Arctic and Nordic regions*'. This provided a valuable opportunity to conduct interviews with my fellow Canadian panellists as well as other stakeholder representatives working with impact assessments in the Indigenous and territorial governments of the Canadian Arctic. After that, I travelled to Ottawa to conduct further interviews with additional stakeholder representatives working with Indigenous Peoples and/or impact assessments in Indigenous and territorial governments of the Canadian Arctic.

My second round of fieldwork involved two trips to Nuuk. On the first trip, I was participating in a PhD course with The University of the Arctic (UArctic) in Sisimiut, where I was able to extend my transit stay in Nuuk with five days from 28 October to 3 November 2017. On the second trip, I was in Nuuk to give a presentation on a PhD course at Ilisimatusarfik on 12–16 March 2018, where I was also able to conduct further interviews. During these trips, I conducted interviews with stakeholder representatives working with Indigenous Peoples and/or impact assessment regimes in Greenland. During workshops with the Arctic EIA project (*see section 3.3.4*) and at other conferences and meetings in 2018, I was able to conduct supplementary interviews of stakeholder representatives from Arctic Indigenous Peoples' organisations.

Following the data analysis, some of the findings were subjected to friendly review by key persons within the Greenlandic EIA regimes and the Inuit Circumpolar Council before being disseminated in papers and presentations. On several occasions, I was able to disseminate findings before the publication of papers, and thus able to use the feedback to improve on the findings and how to communicate them. An iterative literature review continued throughout the entire research process, although most extensively in the beginning and gradually waning, with minor peaks around the synthesis of papers and summarising text of the PhD thesis. Figure 3.1 illustrates the PhD research process – from project initiation to submission of the thesis – as a timeline, including a chronological ordering of the fieldwork, additional interviews, and participation in related projects.

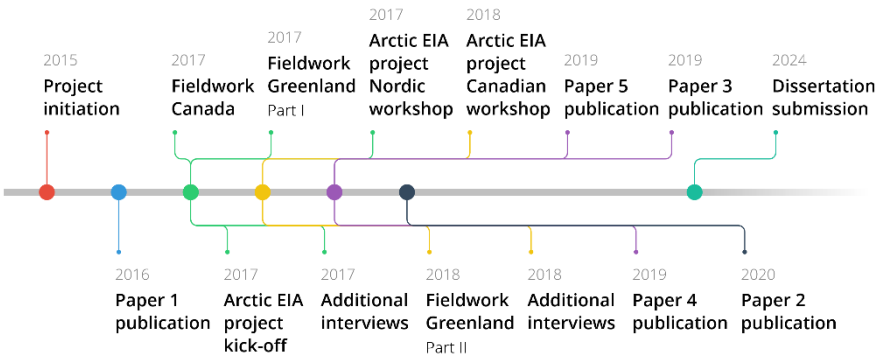

Figure 3.1: *The PhD research process timeline.*

In section 3.4, I elaborate further on my role in the research process. From the beginning, my approach has been inductive and explorative. Rather than starting from a specific theoretical framework, I focused on studies and methodologies, examining data in an attempt at deriving findings emerging from these data. Only later did I identify the theoretical framework that resonated best with my chosen methodologies.

3.2. GROUNDED THEORY

As a PhD candidate, I position myself within the theoretical framework of Informed Grounded Theory (GT) based on the Constructivist strand of GT, acknowledging my background and context and subjectivity in constructing and interpreting data, and using an iterative approach to literature review and data analysis. In this section, GT is described, including its origins, development, and methods.

Grounded Theory and its origins

The positivist research paradigm had gained dominance in the 1960s, influencing research within sociology towards deductive qualitative methods (*Bryant & Charmaz 2007; Charmaz 2014*). The main belief was that the 'grand' theories had already all been developed, and that further research was simply a matter of quantitatively verifying and refining the existing theories. Glaser and Strauss set out to challenge this belief with their book, *The Discovery of Grounded Theory* (*1967*), which outlined a research methodology that they described as '*the discovery of theory from data – systematically obtained and analysed in social research*' (*Glaser & Strauss 1967:1; Bryant & Charmaz 2007; Urquhart 2013; Charmaz 2014*). GT thus represented an inductive qualitative research methodology developing theories or hypotheses from data through systematic and iterative strategies for data collection and analysis (*Charmaz 2014*).

Development of Grounded Theory

GT quickly spread and influenced the qualitative research field, and Glaser and Strauss developed the 'how-to' approaches of their methodology in books and articles, introducing key concepts that were useful in GT. The two co-originators later realised that they perceived the nature of GT itself differently (*Strauss & Corbin 1990*), which triggered a lengthy dispute between them leading to the development of two distinct strands of GT: Glaserian GT and

Straussian GT (*Bryant & Charmaz 2007; Urquhart 2013*). Glaser and his followers termed his strand the 'classic' or 'traditional' GT, emphasising induction, theory emergence, and a more open approach to data analysis. He criticised Strauss' method for being too restrictive, forcing the data and analysis into preconceived categories, ignoring emergence, and resulting in full conceptual description instead of actual grounded theory (*Charmaz 2014*). Conversely, Strauss stressed the importance of deduction and the verification of own concepts. He used a more explicit (some call it 'clear' – others call it 'restrictive') approach to data analysis, believing that only a specific coding paradigm could provide sufficient density and precision (*Bryant & Charmaz 2007; Urquhart 2013*).

Constructivist GT

Charmaz, who had been a student of both Glaser and Strauss, developed a third strand of GT that she officially labelled 'Constructivist GT' in 2000. Although both Glaserian GT and Straussian GT were initially created as a form of protest to the positivism paradigm of their time, they are still considered part of it, not least due to their insistence on the objective role of the researcher and research being about discovering 'truths' (*Bryant & Charmaz 2007; Charmaz 2014*). Constructivist GT comes with a different underlying research paradigm: social constructionism (*Charmaz 1995; 2000*). It views research as constructed rather than discovered, which was in line with social constructionism, where researchers must acknowledge their subjectivity and involvement in the construction and interpretation of data, and they should reflect on their position, privilege, perspective, and interactions as an inherent aspect of their research reality. Charmaz positioned her strand of GT as an improved hybrid, meeting the points of criticism of the earlier strands of GT by adopting the inductive, comparative emergent, and open-ended approach originally presented by Glaser and Strauss, while including the iterative logic of Strauss and his emphasis on action and meaning, as well as highlighting the flexibility of method upon which Glaser was insisting. GT is now used as an umbrella term for the three major strands of GT (Glaserian, Straussian, and Constructivist GT) and different versions and development of their methodologies, all of which offer strategies for collecting, managing, and analysing qualitative data (*Charmaz 2014*).

Informed Grounded Theory

Informed GT represents a methodological development that adds to the literature review strategies to the GT strands (*Thornberg 2012*). It breaks with a principle from Glaser and Strauss on delaying literature research in the field of research until analysis is nearly completed. They argued that this was necessary to ensure that the theory that the researcher generated was first and foremost grounded in the empirical data (*Thornberg 2012; Charmaz 2014*). The main reason for this principle was due to concerns that reviewing literature prior to analysis could stifle or contaminate the researcher's efforts to develop categories and concepts based on their data, instead forcing the data to fit with concepts that distort or lack relevance for the data. In addition, Glaser argued that it is first towards the end of analysis that the researcher has enough knowledge to make adequate literature research and relate it to the emerging grounded theory, at the same time ensuring that time would not be wasted on reading the wrong literature.

Charmaz (*2000; 2014*) and Thornberg (*2012*) questioned the principle of delaying literature research until near the end of analysis. Charmaz (*2014*) explains how a preliminary and non-committal literature review can help to clarify the research field and research questions without imposing a framework on data collection, and that an end-of-analysis literature review can then integrate the emerged theory with relevant literature. Thornberg (*2012*) takes it a step further with his 'Informed GT', arguing in line with social constructionism that researchers must acknowledge the historical, ideological, and socio-cultural context in which they exist, and that pure induction is impossible. He recognises the analytical power of the iterative interplay between induction and abduction, and he suggests literature review strategies in which the researcher uses sensitising principles to remain open-minded and data-sensitive by becoming aware of their theoretical knowledge and assumptions. In so doing, the researchers can take advantage of pre-existing theories and research findings within the research field without forcing non-fitting or irrelevant theories and assumptions onto their analysis. While Informed GT is rooted in Constructivist GT, Thornberg claims that its sensitising principles and literature review strategies also fit with other GT strands and versions.

GROUNDED THEORY METHOD

While GT is a theoretical framework, it is also a method aimed at producing a grounded theory, which has led some researchers to call it 'Grounded Theory Method' to distinguish it from its product (*Bryart 2002; Urquhart 2013*). Besides producing a theory, GT may also be used to produce useful categories and descriptions of concepts. A GT study does not have to be based on a theory and start with a research question or hypothesis; instead, it may start with a data collection from which a theory, research question, and/or hypothesis emerge in the course of the analysis.

Urquhart (*2013*) and Charmaz (*2014:15*) describe the core process of the GT method as a collection and analysis of data in an iterative process in which labels or concepts become apparent and form conceptual categories through an initial coding process. Following a focused coding process, every slice of data is then constantly compared with existing categories to see if they enrich an existing category or possibly form a new category until the categories are saturated. This forms the basis for establishing a grounded theory emerging from the data, and this theory can then be further tested through the theoretical sampling of other data types. The two main coding steps can be described further, as follows:

1) **Initial (open) coding:** Data are analysed (either line-by-line or based on what is considered primary data) and labelled with initial codes and grouped into conceptual categories or concepts as they appear.

2) **Focused (selective) coding:** The data are then compared with existing categories to see if they enrich it or form a new category (prompting a return to open coding) until the categories are saturated. These are then related to a core category and emerging theme(-s).

In Constructivist GT, these additional steps are optional (*Charmaz 2014*), although they may be considered mandatory or recommended in the other strands:

3) **Axial coding (Straussian GT):** Selective coding may be combined with a coding paradigm of properties and dimensions. Categories are related theoretically to e.g., conditions, contexts, interactions, strategies, and consequences.

4) **Theoretical coding (Glaserian GT):** Further theoretical reflections about how substantive codes and categories relate to each other and the core category as a step towards theory building, aided by so-called 'coding families' identified by Glaser.

These steps are all accompanied by memo-writing in which the iterative thought processes are documented, explaining the rationales for making decisions on coding, categorising, and theory building. Findings are then written up and disseminated. The overall process of the Constructivist GT method are illustrated in Figure 3.2.

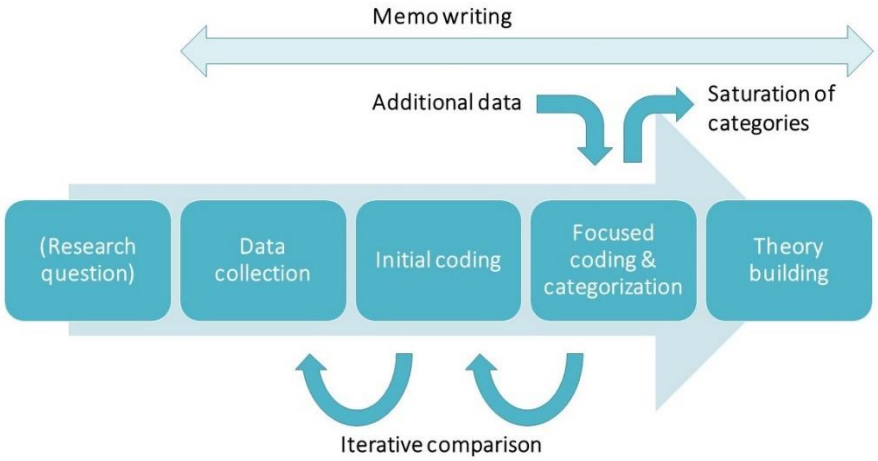

Figure 3.2: *The overall process of the Grounded Theory method (adapted from Charmaz 2014).*

APPLICATION OF GROUNDED THEORY METHOD

I was initially unaware of GT as a theoretical framework and method, and my preliminary analysis for my first paper, Paper 1: t*he Skills article*, was therefore based on my inductive and exploratory approach. As I learned about GT and understood how well it resonated with my initial approach, I applied the method more systematically and consistently in further analyses for papers. It was applied in particular in Paper 2: *the Concept article* and Paper 3: *the White Paper article*. The Concept article describes the practical application of the GT method in detail (*see Paper 2 in Appendix C*). The method is only described in rudimentary terms in the White Paper article, and further elaboration is therefore presented below.

Example: Indigenous knowledge in white papers

In Paper 3: *the White Paper article*, I wanted to study whether Indigenous knowledge occurred in EIA white papers and whether they led to changes in the EIA reports. In preparation to do so, I conducted a preliminary literature review (Informed GT literature review strategy) on knowledge concepts of Indigenous Peoples, providing an informed foundation of which elements and topics were often covered. I assembled a list for use as inspiration to search for indications of Indigenous knowledge (*see Paper 3, pp: 169–170 in Appendix C*).

To distinguish between Indigenous knowledge and local knowledge, I needed to identify the knowledge holders. Whether individuals or representatives of a group (e.g. authorities, institutions, organisation, or other entities), I had to characterise them as Indigenous or non-Indigenous; more specifically, as Kalaallit or non-Kalaallit (*see also Chapter 2 on Indigeneity in Greenland*). Since I could not ask them in person to learn how they self-identified, I had to use my intuitive understanding and knowledge of Greenlandic society and culture to characterise them. The white papers only provided location, name, and the comments of respondents in three language versions (Greenlandic, Danish, and English). Based on these limited prerequisites, I made a holistic assessment of the likelihood of whether the individual or representative was Greenlandic or non-Greenlandic. For individuals, I built a theory, developing a hypothesis with six cultural identity markers (see Figure 3.3) that I could use to characterise individuals.

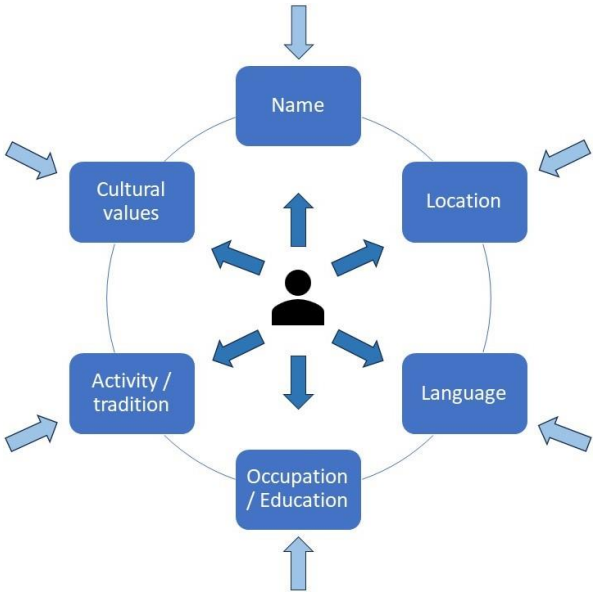

Figure 3.3: *Overview of cultural identity markers (text boxes) used to characterise individuals as Kalaallit or non-Kalaallit. Dark blue arrows indicate the individuals' self-identifications, whereas the light blue arrows indicate the researcher's interpretation.*

The markers were used to assess the likelihood of an individual being Kalaallit, but not all markers may be available for each individual. None of the markers can stand alone, and each must be assessed in conjunction with the others. For each marker, I asked questions and searched for indications, as further described in Table 3.1 below.

Table 3.1: *Cultural identity markers, related questions, and the search for indicators of the individual being Kalaallit or non-Kalaallit.*

Cultural identity marker	Question	Indications of ethnicity
Name	Is the name typical of traditional Greenlandic naming patterns?	• Biblical, Danish, and Greenlandic first names • Many first names • Historical surnames
Location	What is the typical composition of ethnicities at the given location?	• Larger towns = higher diversity • Smaller settlements = lower diversity
Language	Do the grammatical structures indicate the individual's first language?	• Greenlandic and Danish have reverse word orders • 'Clumsy' sentence structure = translation bias
Occupation / education	Does the individual describe their own occupation or education level?	• Characteristic occupations • Type of education • Level of education
Activity / tradition	Does the individual mention activities or traditions in relation to culture and nature?	• Cultural traditions • Use of nature e.g., hunting and fishing
Cultural values	Do questions, remarks, concerns, or critiques indicate cultural values?	• Human–nature relationship • Stewardship of resources

For the representatives of groups (e.g. authorities, institutions, organisations), I investigated the name and purpose of the group, where it is based, and who the representative providing the comment is. This could all indicate which type of stakeholders they are, their affiliation with Greenland, and whether their representative can be characterised Kalaallit/non-Kalaallit, and on that background whether they possess Indigenous or local knowledge.

Continuing with the GT method, I printed out white papers and read all of the respondents' comments, which ranged from questions or remarks to criticism. I began the initial coding session by marking sentences and words and writing notes (memo writing) whenever I looked for indications of knowledge and observations, practices, and traditions, as well as values and priorities that – in my experience – reflected Kalaallit culture. As I worked through the white papers, I developed a sense of emerging categories that warranted closer scrutiny. I then began the focused coding session by re-reading the white

papers once or twice, actively using the emerging categories to compare data and to see if they added to a category and reinforced it or if they prompted an adjustment or separation into new categories and sub-categories. In so doing, I applied the GT method to identify Indigenous knowledge in white papers. The strength of the GT method in this case is using the data to find emerging themes; the weakness is that the theory is a hypothesis that has not yet been tested by asking individuals to validate whether I characterised them correctly; and it has not yet been tested by others.

3.3. EMPIRICAL DATA COLLECTION

This section describes the empirical data collection, either as conducted on the desktop (*section 3.3.1 on literature reviews*) or in the field (*section 3.3.2 on interviews and section 3.3.3. on participant observation*). Examples of how GT was applied as a method are also included.

LITERATURE REVIEWS

For Paper 1: *the Skills article*, my aim was to gain an overview of knowledge concepts of Indigenous Peoples and of Greenlandic impact assessment legislation. The literature review approach was of a preliminary character, as I was guided by my primary supervisor and one of my secondary supervisors. As established scientists within the field, they pointed me in the direction of academic literature and grey literature that they deemed essential for me to read.

For Paper 3: *the White Paper article*, my aim was a more detailed exploration of the knowledge concepts of Indigenous Peoples and to dive deeper into Greenlandic legislation related to extractive industry activities. I also used citation tracking as a search method to identify additional relevant literature from reference lists. For grey literature, I included related documents that I knew beforehand from my work for ICC–Greenland together with impact assessment documents recommended by the IAIA. I also searched the relevant Naalakkersuisut websites for the latest legislation documents, skimming them for language related to Indigenous Peoples and the use of their knowledge.

For Paper 2: *the Concept article*, my aim was to further clarify the similarities and differences between knowledge concepts, and I moved from a preliminary to a full review approach with thorough search strategies (*as*

further explained in Appendix C: Paper 2). I employed direct keyword searches in electronic databases, such as Scopus, SpringerLink, Taylor & Francis Online, and Web of Science. I also used the Aalborg University search engine, Primo, which contains both a physical library and online access to numerous electronic databases, including the aforementioned. I selected both broad and specific key words from different knowledge concepts that I had come across in my preliminary review and of new knowledge concepts of which I had become aware. I combined searches with keywords related to environmental issues and impact assessments, and prioritised search hits of geographic relevance to the Arctic. For grey literature, I selected policy documents (e.g., agreements, declarations, guidelines, and position papers) referring to knowledge concepts sourced from national, regional, and Indigenous governments in the Arctic, and from Arctic Indigenous Peoples' organisations and the Arctic Council. Towards the end, I received feedback from established scientists within the field as well as ICC to quality check the selection of literature.

INTERVIEWS

The methods I used to conduct qualitative interviews are derived from social sciences. Following the semi-structured interview format, I developed an interview guide with thematic questions meant to initiate a dialogue or prompt further discussion in conversation lulls. The questions were open-ended, allowing the interviewee to shape the direction and scope of the conversation. Interviewees were selected from the following five relevant stakeholder categories: a) government agencies, b) Indigenous Peoples' organisations, c) civil society organisations, d) impact assessment practitioners, and e) researchers, all with experience working with Indigenous Peoples and/or impact assessment regimes in the Arctic (Norway, Greenland, Canadian Arctic, and Alaska). The interviewees were chosen based on recommendations from leading experts within the field in addition to snowballing, where interviewees were asked to suggest the names of other relevant experts. The interviews focused on the interviewees' understandings and perceptions of knowledge concepts, as well as the engagement of Indigenous Peoples and use of their knowledge in the respective impact assessment regimes.

Depending on the preference of the interviewee, the interviews were conducted face-to-face in locations such as a workplace office, a quiet spot at a conference venue, or a café. If physical interviews were not possible, they

were instead conducted over telephone, video-chat, or via e-mail correspondence. Ensuring the consent of the interviewees, I audio-recorded the interviews using a recording device with a backup system using a smartphone recording program. I took notes with highlights to supplement the recordings. Some of the recorded interviews were transcribed in whole, while I wrote a short summary of others emphasising main points and important quotes. According to preference, some of the interviewees were sent the transcripts for possible correction, clarification, and final approval. In general, the names of the interviewees and specific agencies, organisations, companies, or institutions that they represented were not mentioned in any findings, and thus remained anonymous. In selected cases, where I wanted to emphasise a specific quote from an interviewee in a paper, I received written consent to do so. The interviews are not included in the thesis but can be accessed by other researchers upon request and after receiving permission from the interviewees.

I also included interviews conducted by my co-author, Alberto Huerta Morales, in our collaborative paper, *the Guidance note*, as it provides empirical data for the PhD thesis. Morales used a slightly different method, conducting six qualitative interviews with directed, open-ended questions provided to the interviewees beforehand in the form of an e-mail questionnaire. The interviewees were selected from similar stakeholder categories: a) government agencies, b) Indigenous Peoples' organisations, c) impact assessment practitioners, and d) researchers, all with experiences in environmental and/or social impact assessment regimes in the European Arctic (Finland, Sweden, Norway, and Greenland). The interviewees were selected on the basis of recommendations from leading experts within the field and according to the availability of individuals within the agencies, organisations, companies, or institutions. The interviews were conducted over the telephone and audio-recorded upon receiving the interviewee's consent. The interviews were transcribed in a somewhat summarised form and were not sent to interviewees for correction, clarification, or final approval. None of the names of the interviewees were mentioned in the paper, and they therefore remained anonymous.

As can be seen in Table 3.2 below, the fieldwork in Canada produced a total of nine interviews, and the outcome of the fieldwork in Greenland was a total of ten interviews. I conducted two supplementary interviews on other occasions, and six interviews were conducted by others. The interviews covered all five stakeholder categories of government agencies, Indigenous

Peoples' organisations, civil society organisations, impact assessment practitioners, and researchers.

Table 3.2: *Overview of interviews conducted during fieldwork in Canada and Greenland, the supplementary interviews and interviews conducted by others, as well as which stakeholder categories they covered.*

	Number of interviews			
Stakeholder categories	**Fieldwork in Canada**	**Fieldwork in Greenland**	**Supplementary interviews**	**Interviews by others**
Government agencies	6	2	N/A	1
Indigenous Peoples' organisations	2	1	2	2
Civil society organisations	N/A	2	N/A	N/A
Impact assessment practitioners	N/A	3	N/A	2
Researchers	1	2	N/A	1

Interviewees also provided recommendations for relevant policy and legislation documents for further analysis. The empirical data from the interviews concerning knowledge concepts from different stakeholder perspectives (relating to Research Question 1) and the engagement of Indigenous Peoples and the use of their knowledge (relating to Research Question 2) all fed into Paper 2: *the Concept article*. The interviews were used to gather information as well as to verify and support findings from my literature and legislation reviews and the analysis of knowledge concepts using Grounded Theory methods (as described in section 3.2).

PARTICIPANT OBSERVATION

Participant observation is a qualitative research method within sociology that is used to gain insights and understanding of a certain group of individuals and their social practices together with the contextual rules and motivational structures for these practices through concrete presence within the group (*Warming 2007*). The researcher plays a more or less active role as both subjective participant and objective observer of the group. The method is rooted in historic anthropology, ethnographic fieldwork, and sociology, and it can relate to a diverse range of theoretical frameworks and philosophical

positions (*Guest et al. 2013*). One of the earlier well-described examples and appraisals of participant observation in practice is by the pioneer of social anthropology, Bronislaw Malinowski (*1922*), who worked as an ethnographer among the Trobiand Islanders. The method contains a variety of techniques that depend on the objective of the research and positions of the researcher, all with the shared emphasis on the importance of context.

APPLICATION OF PARTICIPANT OBSERVATION

In this section, I describe how I used participant observation as a method during my engagement in a specific project. The method was used to receive feedback and verify my other research, thereby developing a more nuanced understanding of the field. I also identified respondents for interviews and collected new information on perceptions on knowledge concepts through the observations of the discussions raised.

The Arctic EIA Project: 2017–2019

The *Arctic EIA project* was an Arctic Council project under the auspices of the Sustainable Development Working Group. The project was led by Finland and co-led by Canada, the Kingdom of Denmark (Greenland), and Gwich'in Council International during the Finnish Chairmanship of the Arctic Council in 2017–2019. The purpose of the project was to identify and share good practices in EIA which, among others, promote the meaningful engagement of Indigenous Peoples and use of their knowledge in EIAs. The resulting report, *Good Practices for Environmental Impact Assessment and Meaningful Engagement in the Arctic: Including Good Practice Recommendations* (*SDWG 2019*) was adopted in May 2019 at the 11th Arctic Council Ministerial Meeting in Rovaniemi, Finland.

As ICC–Greenland had relieved me of my teaching obligation during the PhD project to work partially for them, and with the relevance of my research topic in mind, I was elected as alternate representative for the ICC in the *Arctic EIA project* editorial group. My participation was funded by the ICC and the Finnish Ministry of the Environment. The editorial group consisted of representatives from all eight Arctic states and six Permanent Participants (Indigenous Peoples' organisations) as well as the Arctic Economic Council. The editorial group was asked to propose a structure for the draft report, identify and discuss the overall themes and potential issues, review rounds of the draft report, and occasionally draft minor text segments for the draft report

as well. During the editorial meetings, I was invited on several occasions to present examples of good practices in Greenland and to share ICC positions on what the meaningful engagement of Indigenous Peoples and use of their knowledge could look like (*see Figure 3.4*). These presentations provided opportunity to disseminate some of my preliminary findings and receive feedback on them. Thus, discussion with my fellow editorial group members influenced my reflections and further PhD research. I also interviewed one of the Permanent Participant representatives (*described in section 3.3.2*).

Figure 3.4: *Arctic EIA project editorial meeting in Yellowknife, Canada on 27 April 2018. From left, Adam Chamberlain (Gwich'in Council International), Parnuna Egede Dahl (ICC), and Gunn-Britt Retter (Saami Council). Photo: P. E. Dahl.*

Since the *Arctic EIA project* was closely related to my research, I took the opportunity to include my participation in the editorial group in my research process. At the time, I was unaware of the participant observation method and acted on intuition, guided by my understanding of the research topic. Later, I learned about the method and realised how closely my immersive experience resembled it. Thus, I retrospectively considered the method's aspects and how I applied them in this project. Warming (*2007*) described a basic structure with eight dimensions (see Table 3.3 below).

Table 3.3: *Overview of eight dimensions and continuum when using the participant observation method, inspired by Warming (2007).*

Dimension	**Continuum**
1. The participant role of the researcher	a) Complete observer (fly on the wall) b) Observer as participant (visible role as researcher, activities different than the observed) c) Participant as observer (visible role as researcher, more natural participation) d) Complete participant (invisible role as researcher, more natural participation)
2. Degree of openness about the research	a) Full explanation b) Partial explanation c) No explanation d) Fake explanation
3. Degree of openness about the purpose of the research	a) Full explanation b) Partial explanation c) No explanation d) Fake explanation
4. Duration and density of the research	• Time • Level of engagement
5. Degree of focus in observations	• Descriptive (broad) • Focused (directed) • Selective (narrow)
6. Senses in play	• Objective • Subjective • Physical senses • Feelings • Emotions • Thoughts
7. Observations are directed towards:	• Spoken/written content • Behaviour • Body language
8. How are observations sought to be objectified and scientifically validated?	• Frame • Participants • Activities and interaction • Duration and variation • Subtle factors

I used this as a starting point when describing how I applied participant observation as a method:

1) The participant role of the researcher

My role was c) *participant as observer* (visible role as researcher, more natural participation); the editorial group knew that besides being a representative of an Indigenous Peoples' organisation, I was also researching the topic.

2) Degree of openness about the research

My openness was somewhat limited, as I only gave a b) *partial explanation* about my research. I did present part of my studies for the editorial group, and I openly interviewed one participant, although I did not inform the editorial group that I was also including observations from my participation in the editorial group.

3) Degree of openness about the purpose of the research

My openness was somewhat limited, as I only gave a b) *partial explanation* of the purpose of my research. While I did present my research questions for the editorial group, I did not inform them that I wanted to apply them to my participation in the editorial group as well.

4) Duration and density of the research

I participated in the editorial group during the three years that the Arctic EIA project lasted. This included three workshops in different countries, each lasting several days. The workshops required whole-day presence, including meals and social events, and the level of engagement was immersive and personal. The participation also included online meetings and continuing e-mail correspondence between the workshops.

5) Degree of focus in observations

My focus in observations was descriptive in the early phase of the research period, broad and open to emerging topics. Later in the research process, my observations became more focused, directed towards the most relevant topics of my research.

6) Senses in play

Of the physical senses, I mostly used my sight and hearing. I took notes to remember things that caught my attention but otherwise worked in a relatively unstructured and intuitive manner. As I was actively engaged in discussions, my experiences became more subjective than objective in nature.

7) What observations are directed towards

I observed myself and the other participants in the editorial group. My observations were directed towards the spoken and written content related to the research topics, including perceptions and the joint negotiation of concepts. I also observed group dynamics between stakeholders, including behaviours and the interactions between persons.

8) How observations are sought to be objectified and scientifically validated

- ***Frame:*** The project was led and organised by another team, which provided the external framework for my observations. My participation and note-taking seemed natural in these settings.
- ***Participants:*** It was not possible for me to use triangulation as a verification method; that is, to verify my observations with an additional participating researcher with the same research purpose. Moreover, I did not verify my observations with the participants themselves, asking if my observations of them were understood correctly (although, I did talk with people who had participated in similar settings in the same forum, who confirmed my understanding of the issues).
- ***Activities and interaction:*** Activities like workshops, online meetings, and e-mail correspondence provided both immediate interactions and time to reflect on them. This added nuance to my observations.
- ***Duration and variation:*** The three-year project provided sufficient time to confirm my initial observations as well as to elaborate on and add nuance to the details.
- ***Subtle factors:*** Regarding the factors of my own appearance (female, younger-than-average participant, Indigenous, researcher), I felt that the Indigenous factor had the most influence on how the other participants interacted with me. I unwillingly became part of an underlying positioning between government representatives and Indigenous representatives, whereas the other researchers and practitioners could position themselves more neutrally.

The dual nature of the participant observation method requires a dual reckoning. In my case, it turned out to be as participant in relation to my own cultural background, as an Indigenous Kalaallit woman, while simultaneously striving to fulfil the objective observer ideal. As Haraway (*1991*) suggests, however, this pursuit essentially involves self-deception, as it assumes the illusory perspective of a positionless view of everything. For my part, the strength of the method may lie in my Indigenous cultural background, as I did

not have to spend as much time decoding the information based on statements from Indigenous Peoples' organisations. Conversely, this could also be a weakness in terms of introducing a bias in achieving the objective observer approach. Nonetheless, my previous training in natural science research also provided me with experience in striving for objectivity in data collection.

The fact that I only learned about this method and considered its aspects in my application of participant observation in retrospect raises some ethical considerations. It affects my role and my openness about my research and purpose towards the other participants. They have not been able to give their informed consent, and I have no way of knowing if they would have interacted differently if they had known it in advance. This is both a strength and weakness, and I have therefore chosen to anonymise and generalise my observations to ensure that they cannot be attributed to named participants.

Using participant observation as a method provided empirical observations of how different stakeholders discussed knowledge concepts and which issues of controversy surrounded these concepts. I used my observations to verify and support findings from my own literature and legislation reviews and analysis of knowledge concepts using GT methods. My participation in this project also provided examples of good (and bad) practices of using Indigenous knowledge in Arctic EIA processes. The outcomes of the participation in the editorial group of the Arctic EIA project included the gathering of empirical observations of stakeholder perceptions of knowledge concepts, including a co-created definition of local knowledge that fed into Paper 2: *the Concept article*, and recommendations from the Arctic EIA project report that fed into Paper 4: *the Guidance note* on enhancing Indigenous and local community participation in Arctic EIA processes.

3.4. MY ROLE IN THE RESEARCH PROCESS

At a PhD course on social theories of science at Aalborg University, I found that the theory of Social Constructionism best suited my position. This theory views the researcher as subjective and the research as constructed rather than discovered (*Charmaz 2000*), as mentioned in section 3.2. It explains how the world is understood and how notions are negotiated and developed through interactions and collective constructions in a perceived social context (*Fairhurst & Grant 2010*). According to social constructionism, researchers cannot be entirely objective in their pursuit of truths and must recognize how their subjectivity plays a role in constructing and interpreting data (*Charmaz*

1995; 2000). As part of the research process, it is thus necessary for the researcher to be aware of their theoretical knowledge and assumptions, influenced by their historical, ideological, and socio-cultural context (*Thornberg 2012*). Reflection on the researcher's roles helps identify influences and assumptions that shape the positions, perspectives, and interactions in the research process.

Thus, reflecting on my own role in the research process, my starting point is influenced by two of my main backgrounds and related experiences. First, coming from a background as a biologist with a specialty in biological oceanography – and thus trained in natural sciences and related methodologies – my knowledge of philosophical theories used for social science research and related methodologies has been quite limited; just getting into the language of social sciences has been quite challenging. My approach from the outset has therefore been inductive and exploratory, instead of starting from a specific theoretical framework. I have been examining the empirical data and attempting to derive a general context and themes, and further developing categories and descriptions, and finally hypotheses to be tested in other contexts. It was first later that I gained knowledge of which theoretical framework resonated best with this approach.

Second, my background as an Inuk from Greenland with experience as an advisor on environmental issues for ICC–Greenland has nurtured a professional interest for the interface between Indigenous Peoples, research, and policy. This has coloured my approach with a normative attitude that Indigenous Peoples have the right to be engaged in a meaningful way in policy- and decision-making processes in accordance with the FPIC principle (*as referred to in Chapter 2: Setting the Scene*). Therefore, I have preconceived assumptions that Indigenous knowledge can contribute and add value to impact assessments. Moreover, I have preconceived assumptions about how what is currently being done in impact assessment processes to engage Indigenous Peoples and make use of their knowledge is not good enough and that improvement is necessary.

I am critical, but my criticism is constructive in the sense that I not only focus on what is not working, but also on what *could* work. This approach is reflected in my last research question, which is directed towards how to improve the processes rather than merely describing the processes. I also take advantage of pre-existing theories and research findings within the research field, which thus acknowledges the historical, ideological, and socio-cultural context in which I exist. My positions and perspectives shape how I interact

with my research field, meeting people as a Greenlandic researcher and an Indigenous researcher (see e.g. Figure 3.5).

Figure 3.5: *Canadian Minister of Environment and Climate Change Catherine McKenna and PhD Fellow Parnuna Egede Dahl at the International Association of Impact Assessment Conference in Montreal, 4–7 April 2017 (Source: Twitter).*

CHAPTER 4. SUMMARIES OF PAPERS

This chapter summarizes the five papers in the article-based PhD thesis, including tables with key details. Full papers are available in Appendix C.

4.1. PAPER 1: TRADITIONAL KNOWLEDGE AND INDUSTRIAL DEVELOPMENT: ON THE POTENTIAL USE OF INDIGENOUS AND LOCAL KNOWLEDGE AS A RESOURCE TO ASSESS COMPETENCIES IN GREENLAND

Anne Merrild Hansen, Pelle Tejsner & Parnuna Egede. 2016. Chapter 7.1 in *Perspectives on skills – an anthology on informally acquired skills in Greenland*. Greenland Perspective, University of Copenhagen, pp. 152–166. The chapter was synthesised in Kleist et al. 2016. Sitting on Gold: A report on the use of informally acquired skills in Greenland. Greenland Perspective, University of Copenhagen and Ilisimatusarfik, pp. 1–46, feat. fig. 1, p. 10.
https://orbit.dtu.dk/files/126842966/Sitting_on_Gold_25._maj_2016.pdf
https://pure.au.dk/ws/files/107172693/Perspectives_on_skills.pdf
https://backend.orbit.dtu.dk/ws/portalfiles/portal/126842966/Sitting_on_Gold_25._maj_2016.pdf

Based on the assumption that traditional knowledge represents a potential resource, we discuss traditional knowledge within the context of industrial development in Greenland. Rather than discussing if traditional knowledge is always relevant, valuable, and accessible, we focus on how traditional knowledge can be used in developing industries for the benefit of local communities. Based on literature reviews, we outline the concept of traditional knowledge together with related concepts, giving an overview of the challenges and disputes surrounding these concepts and their implementation. We review cases of how traditional knowledge has been applied in development projects in Greenland, mainly within environmental monitoring and the management of living resources. Based on our experiences and the cases, we argue that possessing traditional knowledge can be seen as a complementary qualification and useful competence in an industrial development context. The potential benefits of using traditional knowledge are related to capacity building and the inclusion of local content, sustainable development, and employment opportunities for local workforces within the oil, mining, and tourism industries in Greenland. In the extractive industry sector, traditional knowledge may be relevant for environmental monitoring programmes as well as in baseline studies and the identification

of mitigation measures in EIA/SIA processes. We point out that further research is needed to identify and document traditional knowledge, to explore the possible certification of traditional knowledge qualifications and competences, and to explore whether commercial certification is even ethically desirable. I also developed a theoretic model with an Euler diagram showing similarities and differences between traditional knowledge and conventional science, which was used in chapter 3.1 of the anthology (see Table 4.1 for a summary of the details from this paper).

Table 4.1: *Summary of Paper 1: the Skills article, showing the title, original research question for the paper, its relation to the PhD sub-questions, theory and methods applied, and findings.*

Title of Paper 1	**Traditional knowledge and industrial development: On the potential use of Indigenous and local knowledge as a resource to assess competencies in Greenland** (the Skills article)
Research questions	• Can possessing traditional knowledge be viewed as complementary qualifications and useful competences when it comes to the proposed industrial development in Greenland?
PhD sub-questions	SQ1, SQ2, SQ3
Theory	None
Methods	Literature review, case review
Findings	• Initial mapping of knowledge concepts for Indigenous Peoples • Possessing traditional knowledge can be seen as a complementary qualification and useful competence in the context of industrial development • Traditional knowledge may be relevant for environmental monitoring programmes and EIA/SIA processes, including baseline studies • Development of theoretic model with an Euler diagram of similarities and differences between traditional knowledge and conventional science

4.2. PAPER 2: REVIEW AND MAPPING OF INDIGENOUS KNOWLEDGE CONCEPTS IN THE ARCTIC

Parnuna Egede Dahl & Pelle Tejsner. 2020. Chapter 14 in *Routledge Handbook of Indigenous Peoples in the Arctic*, pp. 233–248.
DOI: https://doi.org/10.4324/9780429270451

In this chapter, we review various concepts and their interrelatedness regarding the knowledge of Indigenous Peoples. The lack of consensus on definitions and the fact that they are often used interchangeably creates confusion and spurs discussions about the understanding of their meanings and implications. While the importance of using the knowledge of Indigenous Peoples alongside science has been acknowledged, the lack of clarity can pose challenges in relation to how this knowledge is applied. We review the most common and frequently used knowledge concepts in the Arctic: traditional knowledge, traditional ecological knowledge, Indigenous knowledge, Inuit Qaujimajatuqangit, and local knowledge. After reviewing the academic and grey literature on the selected knowledge concepts, we provide a summarised description of the characteristics. The review is supported by qualitative semi-directed interviews with government agencies, Indigenous Peoples' organisations and academics working with Indigenous Peoples in Greenland, the Canadian Arctic, and Alaska. Using this review information as data we code and develop categories of characteristics. We use these categories as parameters to develop and visualise concept maps with an Euler diagram and concept circles to theorise about the similarities and differences between the concepts and how they are interrelated. According to our analysis, the knowledge concepts differ especially on the parameters of identity (Indigenous, non-Indigenous, not specified), locality (specific geographic location or generic), and perceived timeframe (historical continuity in traditions and practices versus dynamic and contemporary). We argue that when utilising the knowledge of Indigenous Peoples, it makes a difference whether or not the collective rights of Indigenous Peoples, including the FPIC principle (Free, Prior and Informed Consent), are acknowledged in the process. The concept of Indigenous knowledge is the only concept that implies these rights, which provides leverage for the empowerment of Indigenous Peoples. Our review suggests that the colonial and political-economic processes are shaping the use and understanding of knowledge concepts in various regions of Greenland, the Canadian Arctic, and Alaska. We also observe a transition in the use of concepts from traditional knowledge to Indigenous knowledge; albeit a slow and inconsistent shift (see Table 4.2 for a summary of details for the paper).

Table 4.2: *Summary of Paper 2: the Concept article showing the title, original research question for the paper, its relation to the PhD sub-questions, theory and methods applied, and findings.*

Title of Paper 2	**Review and mapping of Indigenous knowledge concepts in the Arctic** (the Concept article)
Research questions	• How are the various knowledge concepts for Indigenous Peoples similar and different from each other, and how are they interrelated?
PhD sub-questions	SQ1
Theory	Informed grounded theory – Constructivist strand (*Charmaz 2000, Thornberg 2012*), Participant Observation
Methods	Literature review and analysis, qualitative interviews, concept mapping visualisations
Findings	• Co-creation of a definition of local knowledge (from Arctic EIA project) • Knowledge concepts differ, especially on the parameters of identity, locality, and timeframe • Indigenous knowledge is the only knowledge concept encompassing Indigenous Peoples' rights • There is an ongoing transition in the use of knowledge concepts from traditional knowledge to Indigenous knowledge • Development of concept maps with an Euler diagram and individual concept circles to visualise similarities and differences between the knowledge concepts and how they are interrelated • Different colonial and political-economic processes shape the use and understanding of knowledge concepts in Greenland and the Arctic, but there is an ongoing transition from traditional knowledge to Indigenous knowledge

4.3. PAPER 3: DOES INDIGENOUS KNOWLEDGE OCCUR IN AND INFLUENCE IMPACT ASSESSMENT REPORTS? EXPLORING CONSULTATION REMARKS IN THREE CASES OF MINING PROJECTS IN GREENLAND

Parnuna Petrina Egede Dahl & Anne Merrild Hansen. 2019. Article published in *Arctic Review on Law and Politics*, Vol. 10, 2019, pp. 165–189.
DOI: http://dx.doi.org/10.23865/arctic.v10.1344

This article explores how Indigenous knowledge is used in impact assessment processes in Greenland. Impact assessment processes involve stakeholder engagement and public consultation, thereby offering arenas for the potential use of Indigenous knowledge. However, public consultation meetings are not specifically designed to solicit Indigenous knowledge. We begin by discussing how Indigenous knowledge can be conceptualised in relation to mineral resource activities, followed by a review of regulatory impact assessment regimes in Greenland. We identify three phases of impact assessment processes that serve as current and potential arenas for utilising Indigenous knowledge: scoping, impact assessment, and report review. Oral and written comments received from public consultations of impact assessment reports are documented in white papers, as well as if and how they lead to changes in the reports. We analyse white papers from three mining cases in Greenland under the current regulatory regime to investigate if and how Indigenous knowledge occurs and how it influences the impact assessment reports. We also focus on how the recognition and documentation of Indigenous knowledge can be improved in impact assessment processes. Stakeholders typically consist of citizens, Greenlandic government agencies and organisations, scientific institutions outside Greenland, and interest organisations, such as civil society organisations (CSOs), non-governmental organisations (NGOs), and industrial organisations. In all three cases, comments indicating Indigenous knowledge can be identified in the white papers, albeit in smaller numbers compared to other comments. Few of the comments indicating Indigenous knowledge lead to changes in the impact assessment reports, and none in a significant manner. Based on the study, we develop an analytical tool with one requirement and four themes to identify comments indicating Indigenous knowledge in white papers; the requirement being that the respondent must have Indigenous origins and the comments must indicate at least one of the following four themes: Knowledge about Indigenous topics; Traditional lifestyles and activities; Concerns and priorities reflecting cultural values; and Indigenous Peoples' rights (see Table 4.3 for a summary of details for the paper).

Table 4.3: *Summary of Paper 3: the White Paper article showing the title, original research question for the paper, its relation to the PhD sub-questions, theory and methods applied, and findings.*

Title of Paper 3	**Does Indigenous knowledge occur in and influence impact assessment reports? Exploring consultation remarks in three cases of mining projects in Greenland** (the White Paper article)
Research questions	• Does Indigenous knowledge occur, and how, in white papers of impact assessments in relation to mining projects in Greenland? • Does Indigenous knowledge influence impact assessment reports, and to what degree? • Can Indigenous knowledge be recognised and documented in impact assessment processes in Greenland?
PhD sub-questions	SQ1, SQ2
Theory	Informed grounded theory – Constructivist strand (*Charmaz 2000, Thornberg 2012*)
Methods	Legislation review and case review/analysis
Findings	• Three phases in EIA/SIA processes (scoping; impact assessment; report review) are identified as arenas for use of Indigenous knowledge in relation to mineral resource projects in Greenland • Stakeholders typically consist of Greenlandic citizens, Greenlandic authorities, Greenlandic institutions, Danish authorities, Danish institutions, and interest organisations within and outside Greenland • Indigenous knowledge does occur in white paper comments, although in small numbers, and not leading to any significant influence on impact assessments • An analytical tool consisting of one requirement and four themes is suggested as the basis for identifying comments indicating Indigenous knowledge

4.4. PAPER 4: GUIDANCE NOTE ON INDIGENOUS AND LOCAL COMMUNITY PARTICIPATION IN ENVIRONMENTAL IMPACT ASSESSMENT IN THE EUROPEAN ARCTIC

Sanne Vammen Larsen, Anne Merrild Hansen, Parnuna Egede Dahl & Alberto Huerta Morales. 2019. Guidance note published by the European Investment Bank, pp. 1–58.
https://www.eib.org/en/publications/guidance-note-on-indegenous-and-local-community

This Guidance note was commissioned by the European Investment Bank (EIB) and developed by our team at the Danish Centre for Environmental Assessment (DCEA). It is intended to provide recommendations on improving meaningful Indigenous and local community engagement and participation in environmental impact assessment (EIA) processes in the European Arctic (Finland, Sweden, Norway, Iceland, and Greenland). The Guidance note targets both EIB and other financiers investing in projects requiring EIAs in the Arctic, as well as public and private project proponents wanting to engage with local and Indigenous communities. The first part of the Guidance note presents an overview of EIA frameworks, including national legislation and international guidelines relevant for the European Arctic. Special attention is given to main environmental and social concerns, particularly in relation to climate change and Indigenous Peoples. We then review international best practice documents and national legislations for requirements regarding public participation, with a special focus on Indigenous communities and the European Arctic. We provide an overview of what Free, Prior and Informed Consent (FPIC) means and how it relates to EIA processes, and we discuss the practical implications for the participation of Indigenous Peoples when implementing FPIC. We also review national EIA legislation and international best practice documents in relation to integrating climate change aspects, including the impacts on the health of local and Indigenous communities as well as knowledge sharing in participation processes. The second part of the Guidance note presents an overview of selected cases from the European Arctic and other Arctic regions, providing experiences, best practices and the lessons learned from public participation in EIA processes. This part includes material from interviews with researchers, practitioners, government officials, and representatives from Indigenous Peoples' organisations with experience in environmental/social impact assessments in Finland, Sweden, Norway, and Greenland. The third part of the Guidance note summarises the key messages from the former parts to provide overall recommendations as well as specific

recommendations for the following steps of an EIA process: screening; scoping; assessment; draft EIA Report; decision; and follow-up. This includes checklists for the quality of local and Indigenous participation in EIA processes (see Table 4.4. for a summary of details for the paper).

Table 4.4: *Summary of Paper 4: the Guidance note showing the title, original research question for the paper, its relation to the PhD sub-questions, theory and methods applied, and findings.*

Title of Paper 4	**Guidance note on Indigenous and local community participation in environmental impact assessment in the European Arctic** (the Guidance note)
Research questions	• What are the best practices in EIA processes for the meaningful engagement and participation of local and Indigenous communities in the European Arctic? • How does Free, Prior and Informed Consent (FPIC) relate to EIA, and what are the implications of applying FPIC to the participation of Indigenous Peoples?
PhD sub-questions	SQ2, SQ3
Theory	Participant observation
Methods	Legislation and guidelines review, case review/analysis, and qualitative directed interviews
Findings	• Greenlandic legislation requires separate EIA and SIA processes, although none of them includes FPIC for engagement of Indigenous Peoples • Two phases in EIA/SIA processes (scoping; report review) are identified as official arenas for the use of Indigenous knowledge in relation to mineral resource projects in Greenland • Development of recommendations and checklists to the European Investment Bank and other financiers to ensure a proponent's meaningful engagement and the quality of participation of local communities and Indigenous Peoples, both overall and in the following stages of the EIA process: screening; scoping; assessment; draft EIA report; decision; follow-up; additional items • Community protocols may be a useful tool in the absence of FPIC requirements

4.5. PAPER 5: PICTURING PIKIALASORSUAQ: ETHICS & EFFECTIVENESS OF REPRESENTING INUIT KNOWLEDGE IN AN ONLINE ATLAS

Clive Tesar, Parnuna Egede Dahl & Claudio Aporta. 2019. Essay published in *Journal of Ocean Technology*, spring issue on '*tech-knowledge-y – addressing ocean challenges through innovative technology and traditional knowledge*', pp. 12–22.
https://www.thejot.net/archive-issues/?id=62

The essay is based on the Pikialasorsuaq Atlas, a web-based interactive GIS platform with scientific and Indigenous datasets about the North Water Polynya (Pikialasorsuaq), an ecologically and culturally important sea ice feature between Canada and Greenland. The atlas was made by the Pikialasorsuaq Commission (Inuit Circumpolar Council), Dalhousie University, KNAPK (The Association of Fishers and Hunters in Greenland), and WWF. We describe the methodology of documenting Inuit knowledge and the atlas structure. We then discuss the implications of using Inuit knowledge with other types of data. As Inuit knowledge is highly contextual, the challenge of de-contextualisation consists of a loss of multidimensional and holistic aspects, risks of misinterpretation, and cultural appropriation. A recurring challenge in the interface between Indigenous knowledge and conventional science is the failure to realise and accept the different epistemologies of each knowledge system, with own frameworks of values, criteria, methodologies, and validation processes. The conformation and filtering of Indigenous knowledge to scientific standards continues historical power imbalances. Indigenous Peoples call for a more balanced synergy, where Indigenous knowledge is treated as a separate and complementary knowledge system in its own right. We also discuss the benefits of sharing Inuit knowledge, including increased visibility to larger audiences, data interaction that improves the knowledge base and leads to better decision-making, as well as competing with scientific knowledge about significance and influence in new narratives that can benefit Indigenous Peoples. We conclude by suggesting a better model for collaboration through the co-production of knowledge between Indigenous Peoples and researchers, including increased control over how Indigenous knowledge is used, and defining research questions, methodologies, data collection as well as data analysis and interpretation together, thereby empowering Indigenous Peoples (see Table 4.5. for a summary of details for the paper).

Table 4.5: *Summary of Paper 5: the Pikialasorsuaq essay in the thesis showing the title, original research question for the paper, its relation to the PhD sub-questions, theory and methods applied, and findings.*

Title of Paper 5	**Picturing Pikialasorsuaq: Ethics & Effectiveness of Representing Inuit Knowledge in an Online Atlas** (the Pikialasorsuaq essay)
Research questions	• What are the main challenges of representing and using Inuit knowledge as datasets in an interactive GIS atlas with other types of data? • What are the consequences of de-contextualisation and reconstruction of knowledge?
PhD sub-questions	SQ1, SQ3
Theory	Participant observation
Methods	Case review
Findings	• The de-contextualisation of Indigenous knowledge can lead to the loss of important aspects and increase the risk of misinterpretation and misuse • Indigenous Peoples may benefit from new narratives emerging from data interaction if they maintain control of knowledge use and influence on narratives • The co-production of knowledge between Indigenous Peoples and researchers can contribute to more balanced synergy between knowledge systems and empower Indigenous Peoples

CHAPTER 5. SYNTHESIS, DISCUSSIONS, AND CONCLUSIONS

This chapter presents the outcomes of the PhD research, encompassing five papers and additional analyses within the thesis. It synthesises, discusses, and concludes the key findings, focusing on the overarching objective of exploring the engagement of Indigenous Peoples and the use of their knowledge in assessing the environmental impacts of extractive industry activities in Greenland. The chapter also reflects on perspectivation and contributions to the research field.

5.1. SYNTHESIS OF FINDINGS

To answer the main research question – **How can Indigenous knowledge be effectively used as a resource in environmental impact assessments in relation to extractive industries in Greenland?** – revisiting the sub-questions (SQ) helps to examine how the findings from the papers and additional analyses relate to them:

SQ1 – Conceptualisation and perception: How do different stakeholders in the Arctic conceptualise and perceive the knowledge of Indigenous Peoples?

SQ2 – Integration in EIA processes: How is Indigenous knowledge currently integrated into Environmental Impact Assessment (EIA) processes in relation to extractive industry activities in Greenland?

SQ3 – Improving utilisation: What are the potentials of utilising Indigenous knowledge as a resource, and how can its utilisation be enhanced in EIA processes?

Each of the papers and additional analyses contributes with key findings relevant to one or more sub-questions and thus the main research question, as seen in the detailed synthesis of findings for each sub-question and thus the main research question.

SQ1 – CONCEPTUALISATION AND PERCEPTION

The first sub-question (SQ1) on stakeholders' conceptualisation and perception of the knowledge of Indigenous Peoples can be further divided

into issues such as: mapping relevant stakeholders in EIA processes; mapping knowledge concepts, their similarities, differences, and challenges; and exploring how stakeholders use and perceive these concepts. SQ1 is explored in Paper 1: t*he Skills article*, Paper 2: *the Concept article*, Paper 3: *the White Paper article*, Paper 5: *the Pikialasorsuaq essay*, and additional analyses, as summarized in Table 5.1 below with key findings in relation to SQ1.

Table 5.1: *Key findings from the five papers and additional analyses in relation to SQ1 on the conceptualisation and perception of knowledge of Indigenous Peoples by stakeholders.*

Papers	**Findings in relation to SQ1**
Paper 1: *the Skills article*	• Initial mapping of knowledge concepts for Indigenous Peoples • Development of theoretic model with an Euler diagram of similarities and differences between traditional knowledge and conventional science
Paper 2: *the Concept article*	• Co-creation of a definition of local knowledge (from Arctic EIA project) • Knowledge concepts differ, especially regarding the parameters of identity, locality, and timeframe • Indigenous knowledge is the only knowledge concept encompassing Indigenous Peoples' rights • There is an ongoing transition in the use of knowledge concepts from traditional knowledge to Indigenous knowledge • Development of concept maps with an Euler diagram and individual concept circles to visualise similarities and differences between the knowledge concepts and how they are interrelated • Different colonial and political-economic processes shape how knowledge concepts are used and understood in Greenland and the Arctic, but there is an ongoing transition from traditional knowledge to Indigenous knowledge
Paper 3: *the White Paper article*	• Stakeholders typically consist of Greenlandic citizens, Greenlandic authorities, Greenlandic institutions, Danish authorities, Danish institutions, and interest organisations within and outside Greenland
Paper 4: *the Guidance note*	N/A
Paper 5: *the Pikialasorsuaq essay*	• De-contextualisation of Indigenous knowledge can lead to loss of important aspects and increased risk of misinterpretation and misuse
Additional analyses	• Indigenous knowledge systems are separate and complementary to scientific knowledge and have their own epistemologies, methodologies, and verification means

Reviews of EIA legislation in Greenland and examinations of white papers from selected EIA reports of extractive industry cases (*the White Paper article*) revealed that typical stakeholders in EIA processes consist of individual citizens (Kalaallit and non-Kalaallit), Greenlandic governmental agencies and organisations (e.g., ministries and municipalities), scientific/educational institutions inside/outside Greenland (e.g., universities, scientific advisors to the government), civil society organisations (e.g., ICC), non-governmental organisations (e.g., Greenpeace, WWF), and industrial organisations (e.g., business associations). Groups of stakeholders that could be characterised as Indigenous knowledge holders (*Chapter 3.2 on Example: Indigenous knowledge in white papers*) were typically Kalaallit citizens, civil society organisation representatives, and government officials.

The literature review regarding the knowledge of Indigenous Peoples (*the White Paper article; the Concept article*) contributed by mapping the five most common knowledge concepts for Indigenous Peoples and their associated challenges and disputes. As part of the Arctic EIA project (*SDWG 2019*), I participated in the co-creation of a definition of local knowledge, which fed into Paper 2: *the Concept article*. We also found that the knowledge systems of Indigenous Peoples are separate but complementary to scientific knowledge, having their own epistemologies, methodologies, and means of verification, and that they should be respected in their own right (*the Pikialasorsuaq essay, the Arctic EIA project*). This provided a more comprehensive understanding of the characteristics and interrelatedness of knowledge concepts, for which we developed visual concept maps of the similarities and differences in the Euler diagram of traditional knowledge versus scientific knowledge (t*he Skills Article*), Euler diagram and circle diagrams of the five knowledge concepts for Indigenous Peoples (*the Concept article*). The mapping revealed that the knowledge concepts differ primarily on the parameters of identity (Indigenous versus non-Indigenous), locality (specific geographic location versus more widely spread cultures), and perceived timeframe (historical versus contemporary), and that they should not be used interchangeably. The findings also indicated that Indigenous knowledge is the only knowledge concept that encompasses the rights of Indigenous Peoples, which is why Indigenous Peoples' organisations are pushing for the use of this concept rather than traditional knowledge (*the Concept article*). For the same reasons, my initial choice of traditional knowledge as the main knowledge concept (*the Skills article*) was exchanged for 'Indigenous knowledge', and I stopped using the knowledge concepts interchangeably.

Through the participant observation (*Arctic EIA project*) and analysis of legislation, the stakeholders' use and perceptions of knowledge concepts were explored. The terminology used in Greenlandic EIA legislation (*Appendix A*) revealed that there were no references to language related to Indigenous Peoples, instead focusing on a public government approach, and thus indirectly neglecting the aspects regarding Indigenous Peoples' rights. Moreover, scientific knowledge was the preferred legitimate source of information, with local knowledge, traditional knowledge, and expert knowledge as secondary sources. Conversely, Indigenous Peoples themselves prefer the concept 'Indigenous knowledge' and push for an ongoing transition to this concept, as it encompasses their rights and the FPIC principle (*the Concept article*). In relation to the use of Indigenous knowledge in EIA of extractive industries in Greenland, Indigenous knowledge is not seen as a value-adding resource, and scientific knowledge is in higher favour.

SQ2 – INTEGRATION IN EIA PROCESSES

The second sub-question (SQ2) regarding the integration of Indigenous knowledge in EIA processes can be further divided into issues such as: identifying arenas where Indigenous knowledge is used or relevant for use in EIA processes; exploring how Indigenous knowledge has influenced EIA reports in specific cases; and examining challenges and barriers to its effective integration. SQ2 is explored in Paper 1: *the Skills article*, Paper 3: *the White Paper article*, Paper 4: *the Guidance note*, and additional analyses, as summarized in Table 5.2 below with key findings related to SQ2.

Table 5.2: *Key findings from the five papers and additional analyses in relation to SQ2 on the integration of Indigenous knowledge in EIA processes.*

Papers	Findings in relation to SQ2
Paper 1: *the Skills article*	• Possessing traditional knowledge can be seen as a complementary qualification and useful competence in an industrial development context
Paper 2: *the Concept article*	N/A
Paper 3: *the White Paper article*	• Three phases in EIA/SIA processes (scoping; impact assessment; report review) are identified as arenas for use of Indigenous knowledge in relation to mineral resource projects • Indigenous knowledge does occur in white paper comments, although in limited numbers and not leading to any significant influence on impact assessments • An analytical tool consisting of one requirement and four themes is suggested as the basis for identifying comments indicating Indigenous knowledge
Paper 4: *the Guidance note*	• Greenlandic legislation requires separate EIA and SIA processes, although none of them includes FPIC • Two phases in EIA/SIA processes (scoping; report review) are identified as official arenas for use of Indigenous knowledge in relation to mineral resource projects in Greenland
Paper 5: *the Pikialasorsuaq Essay*	N/A
Additional analyses	• Public consultation meetings are neither culturally appropriate nor designed to elicit knowledge from participants • Meaningful engagement of Indigenous Peoples is not the same as using their knowledge in EIA processes

Drawing from case reviews and personal experiences, we argue that traditional knowledge (Indigenous knowledge) holds potential as a complementary qualification and valuable competence in the context of extractive industries in Greenland (t*he Skills article*). In Greenland, legislation on minerals and hydrocarbons exploitation requires separate but complementary EIA and SIA processes (*the Guidance note*). However, neither of these processes incorporate the FPIC principle for engaging Indigenous Peoples (*the Guidance note*), which supports the SQ1-related finding that there are no references to Indigenous Peoples in the language of the legislation (*Appendix A*).

With this in mind, the following reviews of EIA/SIA legislation in Greenland and the exploration of comments in the white papers of EIA/SIA reports helped to identify three arenas for the use of Indigenous knowledge in relation to extractive industries: two official public consultations in the scoping phase and in the EIA/SIA report review phase (*the Guidance note; the White Paper article*); and two potential stakeholder consultations at the baseline and data collection phase and the impact prediction, assessment, and mitigation phase (*the White Paper article*).

Using Grounded Theory, we developed analytical tools to identify both Indigenous knowledge holders (*see also Chapter 3.2 on Example: Indigenous knowledge in white papers for more details*) and Indigenous knowledge in the white papers. Analysing three cases of mining projects in Greenland, we found that Indigenous knowledge is indeed found among the submitted comments recorded in the white papers, although in limited amounts (0–16.5% of total comments). The topics pertaining to the Indigenous knowledge primarily focused on matters such as climate conditions, biological issues, traditional practices, historical and cultural sites, land and water use, and Indigenous Peoples' rights. Even fewer of the comments led to any change in the EIA/SIA reports (0–2.6%), and none of the changes were significant in relation to the project scope or design, impact assessments, or mitigation measures of negative impacts (*the White Paper article*).

From my own experience with participation in public consultation meetings in Greenland and from observations at the Arctic EIA project, it becomes apparent that the format of public consultation meetings in EIA/SIA processes is often neither culturally appropriate nor specifically designed to elicit knowledge but rather to inform and respond to questions without leading to significant changes to the proposed projects (*the White Paper article, the Arctic EIA Project; personal observations*), which supports the ICC argument made during meetings of the Arctic EIA project that the meaningful engagement of Indigenous Peoples is not the same as applying their knowledge in EIA processes.

SQ3 – IMPROVING UTILISATION

The third sub-question (SQ3) on improving the utilisation of Indigenous knowledge as a resource in EIA processes can be further divided into issues such as: examining lessons learned and best practices in Arctic EIAs that can inform Greenlandic EIAs; and identifying potential areas for improvement by

project developers, researchers, practitioners, and decision-makers. SQ3 is explored in Paper 4: *the Guidance note*, Paper 5: *the Pikialasorsuaq essay*, and in additional analyses, as summarized in Table 5.3 below with key findings in relation to SQ3.

Table 5.3: *Key findings from the five papers and additional analyses in relation to SQ3 on improving the utilisation of Indigenous knowledge in EIA processes.*

Papers	**Findings in relation to SQ3**
Paper 1: *the Skills article*	• Traditional knowledge may be relevant for environmental monitoring programmes, in baseline studies, and the identification of mitigation measures in EIA/SIA processes
Paper 2: *the Concept article*	N/A
Paper 3: *the White Paper article*	• Three phases in EIA/SIA processes (scoping; impact assessment; report review) are identified as arenas for the use of Indigenous knowledge in relation to mineral resource projects in Greenland
Paper 4: *the Guidance note*	• Development of recommendations and checklists for the European Investment Bank and other financiers to ensure a proponent's meaningful engagement and the quality of participation of local communities and Indigenous Peoples, both overall and in the following stages of the EIA process: screening; scoping; assessment; draft EIA report; decision; follow-up; additional items • Community protocols may be a useful tool in the absence of FPIC requirements
Paper 5: *the Pikialasorsuaq essay*	• Indigenous Peoples may benefit from new narratives emerging from data interaction if they maintain control over the knowledge use and influence on narratives • Co-production of knowledge between Indigenous Peoples and researchers can contribute to more balanced synergy between knowledge systems and to empowering Indigenous Peoples
Additional analyses	• Indigenous Peoples recommending holistic and culturally appropriate models for meaningful engagement with them

Improving the utilisation of Indigenous knowledge as a resource in EIA processes for extractive industries in Greenland offers opportunities to add value and enhance the knowledge base for political decision-making. As outlined in Chapter 2.3 on Indigenous knowledge in Greenlandic EIA, two official public consultation phases – the public pre-hearing in the scoping phase and the public hearing in the EIA report review phase – can serve as arenas for Indigenous knowledge (*the White Paper article*). Additionally, we

propose three other potential arenas for utilising Indigenous knowledge: the impact assessment phase, including impact prediction and mitigation measures (*the White Paper article*); the baseline and data collection phase (*the Skills article*); and the phase involving the monitoring of impacts post-project approval (*the Skills article*). Engaging Indigenous Peoples systematically and culturally appropriately during these phases allows project developers and contracted EIA practitioners to incorporate their knowledge, priorities, values, and concerns into the decision-making process. A combination of government requirements and industry standards may effectively facilitate the meaningful engagement of Indigenous Peoples.

Examining EIA legislation and cases in Arctic regions for lessons learned and best practices reveals several suggestions for improving the EIA process. Incorporating language on Indigenous Peoples and the FPIC principle into EIA legislation to fulfil the international obligations outlined in ILO C169 and UNDRIP represents a significant step forward (*the Guidance note*). In the absence of FPIC requirements, community protocols may also serve as a useful tool to integrate Indigenous community expectations and concerns ahead of EIA processes (*the Guidance note*). In the Guidance note for the European Investment Bank, we developed an overview of experiences and lessons learned from case reviews and interviews. This resulted in 23 recommendations and a due-diligence checklist with 26 questions for assessing the quality of local and Indigenous participation for the potential financiers of extractive projects. The recommendations spanned the entire project timeline, from screening at the very beginning to follow-up after initiation.

Some of these recommendations are inspired by the work of the editorial group of the Arctic EIA project, in which I participated (*see also Chapter 3.3 on Participant Observation*). The Arctic EIA project itself resulted in a report on good practice recommendations (*SDWG 2019*) with five recommendations, 17 case examples from the Arctic regions, and six holistic and culturally appropriate models for the meaningful engagement of Indigenous Peoples, including an Indigenous-led impact assessment and an Indigenous knowledge-based impact assessment. This aligns with the findings from the Pikialasorsuaq essay, wherein Indigenous Peoples may benefit from maintaining control over the use of their knowledge and exerting influence on the narratives derived from it. This may be achieved through collaborative co-production between Indigenous Peoples and researchers, fostering balanced synergy between knowledge systems and empowering Indigenous Peoples.

5.1. DISCUSSIONS

As mentioned in Chapter 1, the PhD research relies on two fundamental assumptions: 1) Indigenous knowledge is a valuable resource that can add value to environmental impact assessments; and 2) There is room for improvement in how Indigenous knowledge is integrated into such assessments in Greenland.

These assumptions can be challenged in several ways. Critics might argue that the first assumption regarding the value of Indigenous knowledge is flawed. Indigenous knowledge may be too subjective and biased, lacking the empirical rigor of scientific knowledge – at best anecdotal and at worst too unreliable to complement scientific data for EIAs. Counter-critics could argue that scientific knowledge is not truly objective either and is also biased, shaped by a worldview often significantly different from that of Indigenous Peoples, and further complicated by post-colonial implications and power dynamics. Integrating knowledge from various perspectives can provide a more comprehensive understanding. It is precisely when discrepancies arise between Indigenous knowledge and scientific knowledge that valuable insights may emerge. As mentioned in Chapter 1, the bowhead whale case is a good example of how Indigenous knowledge improved and expanded scientific methods, creating new insights and empowering Indigenous Peoples. By remaining open-minded and curious, Indigenous Peoples and researchers can uncover new knowledge by exploring conflicting perspectives together; digging for the gold, so to say.

Critics may also challenge the second assumption about the necessity of improving integration efforts into the EIA process. They might argue that existing EIA legislation and practices have significantly improved since their inception and now adequately include Indigenous perspectives within the framework of a public democratic system. Any perceived shortcomings may be attributed to practical constraints in the process or inherent limitations of Indigenous knowledge itself. However, counterarguments may point out that despite the majority of Greenlanders being Indigenous Inuit and Naalakkersuisut having autonomy over its own EIA regimes and processes, this does not guarantee an inclusive process. An example comes from the LOVISA project (*Lokal Viden og Oprindelig Viden i Sociale Konsekvensvurderinger i Europæisk Arktis*) in which I participated in as a scientific assistant after concluding my PhD research. The project hosted a workshop in Nuuk in 2019 on local knowledge in environmental and social impact assessment, where participants noted that IA guidelines in Greenland

prioritized local knowledge while overlooking Indigenous knowledge as sources of information within the affected communities (*Graugaard et al. 2020*). This underscores that Naalakkersuisut still must respect and incorporate Indigenous Peoples' rights and the FPIC principle in EIA legislation to align with the international obligations to include Indigenous Peoples' perspectives in decision-making processes affecting their lands and resources. The uranium debate in Greenland is another example that illustrates the widespread expectation that Greenlanders wish to be heard in significant decisions about extractive projects that may affect them, as the electoral process alone will not sufficiently address their concerns every four years or so (*Johnstone 2019*). The public expects to be able to exert influence when consulted, and project developers need a Social License to Operate to minimise risks. Both can be achieved through comprehensive engagement processes that foster a sense of ownership and empowerment among the public.

Ultimately, despite the challenges and complexities, integrating Indigenous knowledge can lead to more robust, culturally sensitive, and effective EIAs that benefit both Indigenous Peoples and project developers.

In the White Paper article, it is important to acknowledge that the identification of Indigenous knowledge holders and characterisation of Indigenous knowledge rely on the researcher's interpretations. Conducting in-person interviews would have helped triangulate the findings and provided additional insights into respondents' cultural and ethnic backgrounds. It remains uncertain how respondents would have identified themselves compared to the researcher's interpretation, and this could have been further complicated by the multifaceted identity continuums discussed in Chapter 2.1 on Indigeneity in Greenland. Distinguishing between Indigenous knowledge and local knowledge can prove difficult in practice. For this reason, it makes sense that Greenland's National Research Strategy chose to incorporate both knowledge concepts (*Naalakkersuisut 2022*).

We also found few comments related to Indigenous knowledge in the White Paper article, and they rarely led to revisions in EIA/SIA reports, let alone significant changes to project scope, design, or impact assessment. Critics might argue that this type of knowledge is not deemed relevant for the EIA process. Examining a case with the proposed Isua iron ore mining project near Nuuk sheds light on the potential barriers to effectively utilising Indigenous knowledge. A proposed road was planned through a favourable reindeer calving area and was assessed to have low impact on the reindeer in the SIA

report. Reindeer meat is important in Greenlandic culture, and local hunters, supported by ICC–Greenland, voiced concerns that the road would disturb the reindeer during calving season, potentially displacing them from the area permanently and thus endangering traditional hunting practices. They advocated rerouting the road, but the project developer opposed it, citing higher costs despite projected revenue. This underscores the difficulty in balancing economic interests with Indigenous concerns. The concerns led to an updated SIA report including indicators of impacts on traditional living conditions in a post-approval monitoring plan, although the impact on reindeer and hunting remained assessed as low. This lack of responsiveness from Naalakkersuisut highlights perceived shortcomings in effectively integrating Indigenous knowledge and perspectives into EIA processes.

PERSPECTIVATION

I chose to approach my research field in a pragmatic manner, adding the tools of Grounded Theory method and participant observation along the way, as it proved useful to the process. Grounded Theory holds promising potential to produce theories emerging from data, and had it been applied consciously from the beginning of this PhD research I can only speculate if it could have been used to develop actual theories. As the method was applied late in the process, however, this potential was not realised within the scope of this PhD research. Nevertheless, recognising the value of Grounded Theory, future studies may benefit from incorporating it earlier in the research process to aim for the development of robust theories, which can be compared and tested by other researchers.

Exploring the meaningful engagement of Indigenous Peoples and use of their knowledge in EIA processes includes recognising underlying complexities, such as power dynamics among knowledge holders, knowledge gatekeepers, and decision-makers, as well as the influence of post-colonial relationships between Indigenous Peoples and states. However, it is important to note that these issues were not within the scope of this PhD research. Additionally, alternative theoretical perspectives, such as Theories of Governance or Post-colonial Theory, could have been chosen to examine the same research question from different angles. Considering these perspectives might have produced entirely different narratives regarding the current EIA regime of extractive industries in Greenland.

In the course of my research process, I have directly influenced the research topic under investigation in at least one instance. While working as part of the *Arctic EIA project* editorial group (as referred to in section 3.2.3 on participant observation), I actively contributed as a subjective participant by co-creating the definition of local knowledge used in the project. My contribution was inspired by my accumulated understanding of knowledge concepts at that time. Subsequently, as an objective observer, I included this co-created definition of local knowledge in my paper on the knowledge concepts of Indigenous Peoples (*see Paper 2: the Concept article*), thus coming full circle in influencing the research.

Additionally, I may have indirectly influenced the research topic in another instance during my work with the *Arctic EIA project* editorial group. I had the opportunity to interview a Permanent Participant representative in the editorial group (*as mentioned in section 3.2.2 on additional interviews*). One of my questions pertained to the interviewee's perspective on a proposed transition in the use of knowledge concepts; a topic that the interviewee had not previously considered in depth. Later that year, the Permanent Participants collectively decided to advocate for this very transition in the work of the Arctic Council (*Permanent Participants 2018*). Although it is difficult to determine whether my question indirectly contributed to this decision by raising awareness, this possibility highlights the complex role of the researcher and the potential impact on their research topic.

5.2. CONCLUSIONS

The aim of this PhD thesis has been to explore the engagement of Indigenous Peoples and the use of their knowledge in assessing environmental impacts from extractive industry activities in Greenland. What was finally developed in the thesis is mainly a set of recommendations for how to improve their engagement and the use of their knowledge. The methods employed in the research process are reviews and analysis of literature, legislation, and cases; qualitative semi-directed and directed interviews; and concept mapping, with and without visualisations. These methods are based partially on the theoretical frameworks of the Constructivist strand of Informed Grounded Theory and participant observation. In the following, you will find the key findings from the papers and additional analyses listed in relation to each sub-question (SQ):

SQ1 – Conceptualisation and perception of the knowledge of Indigenous Peoples by stakeholders can be further divided into issues such as: mapping of relevant stakeholders in EIA processes; mapping knowledge concepts and their similarities, differences, and challenges; and exploring how the stakeholders use and perceive knowledge concepts.

- Initial mapping of knowledge concepts for Indigenous Peoples.
- Development of theoretical model with an Euler diagram of similarities and differences between traditional knowledge and conventional science.
- Co-creation of a definition of local knowledge (*from Arctic EIA project*).
- Knowledge concepts differ especially on the parameters of identity, locality, and timeframe.
- Indigenous knowledge is the only knowledge concept encompassing Indigenous Peoples' rights.
- There is an ongoing transition in the use of knowledge concepts from traditional knowledge to Indigenous knowledge.
- Development of concept maps with an Euler diagram and individual concept circles to visualise similarities and differences between the knowledge concepts and how they are interrelated.
- Different colonial and political-economic processes shape the use and understanding of knowledge concepts in Greenland and the Arctic, but there is an ongoing transition from traditional knowledge to Indigenous knowledge.
- Stakeholders typically consist of Greenlandic citizens, Greenlandic authorities, Greenlandic institutions, Danish authorities, Danish institutions, and interest organisations within and outside of Greenland.
- The de-contextualisation of Indigenous knowledge can lead to the loss of important aspects and increase the risk of misinterpretation and misuse.
- Indigenous knowledge systems are separate and complementary to scientific knowledge, and they have their own epistemologies, methodologies, and verification means.

SQ2 – Integration in EIA processes of Indigenous knowledge can be further divided into issues such as: identifying arenas in which Indigenous knowledge is used or relevant to use in EIA processes; exploring how Indigenous knowledge has influenced EIA reports in specific cases; and examining the challenges and barriers to its effective integration.

- Possessing traditional knowledge can be seen as a complementary qualification and useful competence in an industrial development context.
- Three phases in EIA/SIA processes (scoping; impact assessment; report review) are identified as arenas for the use of Indigenous knowledge in relation to mineral resource projects.
- Indigenous knowledge does occur in white paper comments, albeit in limited amounts and not leading to any significant influence on impact assessments.
- An analytical tool consisting of one requirement and four themes is suggested as the basis for identifying comments indicating Indigenous knowledge.
- Greenlandic legislation requires separate EIA and SIA processes, although none of them includes FPIC.
- Two phases in EIA/SIA processes (scoping; report review) are identified as official arenas for the application of Indigenous knowledge in relation to mineral resource projects in Greenland.
- Public consultation meetings are neither culturally appropriate nor designed to elicit knowledge from participants.
- The meaningful engagement of Indigenous Peoples is not the same as using their knowledge in EIA processes.

SQ3 – Improving the utilisation of Indigenous knowledge as a resource in EIA processes can be further divided into issues such as: examining the lessons learned and best practices in Arctic EIAs that can inform Greenlandic EIAs; and identifying potential areas for improvement by project developers, researchers, practitioners, and decision-makers.

- Traditional knowledge may be relevant for environmental monitoring programmes, in baseline studies, and in the identification of mitigation measures in EIA/SIA processes.
- Three phases in EIA/SIA processes (scoping; impact assessment; report review) are identified as arenas for the application of Indigenous knowledge in relation to mineral resource projects in Greenland.
- The development of recommendations and checklists for the European Investment Bank and other financiers to ensure a proponent's meaningful engagement and the quality of participation of local communities and Indigenous Peoples, both overall and in the following stages of the EIA process: screening; scoping; assessment; draft EIA report; decision; follow-up; additional items.
- Community protocols may be a useful tool in the absence of FPIC requirements.
- Indigenous Peoples may benefit from new narratives emerging from data interaction if they maintain control over knowledge use and influence on narratives.
- The co-production of knowledge between Indigenous Peoples and researchers can contribute to more balanced synergy between knowledge systems and empower Indigenous Peoples.
- Indigenous Peoples recommending holistic and culturally appropriate models for meaningful engagement with them.

Overall, the PhD research contributes with a better understanding of how Indigenous Peoples are engaged and how their knowledge is currently utilised in EIA processes in relation to extractive industries in Greenland. Understanding how their knowledge is approached, documented, and used in a process that serves as a basis for decision-making on matters affecting them has also shed light on the potential value added and the challenges and barriers that are hindering the use of their knowledge. Considering Indigenous knowledge as a resource in EIA processes to improve the project design and knowledge base for decision-making may also support a more meaningful engagement of Indigenous Peoples in the EIA processes.

CONTRIBUTIONS TO THE RESEARCH FIELD

This thesis has aimed to address the knowledge gap identified in Figure 2.2, seeking to enhance the understanding of the use of Indigenous knowledge as a supplementary resource to scientific knowledge in the context of mineral resource activities in Greenland. Identifying phases of EIA processes in which it makes sense to use Indigenous knowledge in Greenlandic EIA and providing recommendations and checklists for how to achieve this are contributions of special interest. My hope is that they can partially answer the calls made by Indigenous Peoples' organisations such as ICC by providing inspiration for enhancing the view of Indigenous knowledge as a value-adding resource that complements scientific knowledge, and for providing inspiration to improve the meaningful engagement of Indigenous Peoples and integrate their knowledge into EIAs in relation to extractive industries in Greenland.

FUTURE RESEARCH

During my PhD research, I have gathered much more material from interviews and analyses that has not found its way into published papers. There is especially a large amount of information on the comparison between EIA regimes in Greenland and the different EIA regimes in the Inuit Homelands of the Canadian Arctic, which has the potential to become an interesting paper. Time will tell if this can become a reality.

As a concluding remark, I see an opportunity for researchers, government officials, practitioners, and decision-makers to work together to co-produce culturally appropriate EIA processes in Greenland that implement the recommendations concerning Indigenous Peoples' rights and the FPIC principle.

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APPENDICES

Appendix A. Analysis of terminology in Greenlandic EIA legislation

Investigating the language used in the Greenlandic Environmental Impact Assessment (EIA) legislation sheds light on which knowledge concepts and knowledge holders are considered legitimate sources of knowledge, as well as their engagement in the EIA process. This analysis involves screening the terminology present in both the Mineral Resources Act and official guidelines, allowing for a comparison of the language used. The language was analysed by applying the Grounded Theory (GT) Method within the Constructivist strand of Informed GT (*see also Chapter 3.2*). This process involves identifying keywords that denote knowledge holders, such as Indigenous Peoples, communities, groups, and individuals, employing an initial coding process. Attention is also paid to words that denote knowledge concepts as well as those implying ways of engagement and inclusion in the EIA process. The identified keywords are sorted in alphabetic order (see Table A.1 below).

The Mineral Resources Act itself employs terms such as citizens, local authorities and communities, persons, the public, society, and stakeholders. The recognised sources of legitimate knowledge in the Act are 'expert knowledge' and scientific knowledge, and knowledge holders are engaged through expert consultations and public consultations. The EIA Guidelines for mineral exploitation in Greenland follows the same line as the Act, although adding more detailed terms for knowledge holders, such as traditional users, local hunters, and local fishermen. It employs knowledge concepts such as local knowledge and scientific knowledge, and knowledge holders are engaged through public consultations. The EIA guidelines for hydrocarbon projects also have a similar terminology regarding knowledge holders and their engagement, although the term local knowledge is absent and scientific knowledge is recognised as the sole source of legitimate knowledge.

In summary, the Greenlandic EIA legislation downplays the Indigenous aspect of their terminology, which may relate to the general emphasis on a public, democratic government (*as mentioned in Chapter 2.1 on Indigeneity in Greenland*). This is a notable difference from the official SIA guidelines, where the knowledge concept '*traditional knowledge*' is employed besides

'*local knowledge*' (*see also Chapter 2.3 on Indigenous knowledge in Greenlandic EIA*).

Table A.1: *Overview of keywords on knowledge holders, knowledge concepts, and engagement identified in Greenlandic EIA legislation (alphabetic order).*

EIA legislation in Greenland	Keywords on knowledge holders	Keywords on knowledge concepts	Keywords on engagement
Greenland Parliament Act no. 7 of 7 December 2009 on mineral resources and mineral resource activities (Mineral Resources Act), including the following amendments and explanatory notes: • Greenland Parliament Act No. 26 of 18 December 2012 • Greenland Parliament Act No. 6 of 8 June 2014 • Greenland Parliament Act No. 16 of 3 June 2015 • Greenland Parliament Act No. 34 of 28 November 2016 • Greenland Parliament Act No. 16 of 27 November 2018 • Greenland Parliament Act No. 39 of 28 November 2019 • Greenland Parliament Act No. 27 of 13 June 2023	• Citizens • Cultural values • Greenlandic enterprises • Greenlandic labour • Local authority • Local authority community • Local communities • Persons • Persons who are permanently residing and fully liable to pay tax in Greenland • Public • Public authorities • Recreational values or activities • Relevant organisations • Settlement councils • Society • Stakeholders • Towns • Villages	• Expert knowledge (applicant) • Expertise (applicant) • Research (government advisors) • Scientific and independent environmental institutions • Scientific surveys (applicant and Government advisors)	• Consultation meetings • Consultation period • Public consultation • Public consultation meetings • Public pre-consultation
BMP Guidelines – for preparing an Environmental Impact Assessment (EIA) report for activities related to hydrocarbon exploration and exploitation offshore Greenland (2011)	• Authorities • Fishing • General public • Hunting • Greenland authorities • Local authorities • Stakeholders	• Environmental studies • New environmental knowledge or technology • Scientific knowledge and understanding	• Hearing • Hearing process • Public hearing • Public hearing process • Public review

		• Up-to-date knowledge	• Relevant hearing comments • Stakeholder consultations
BMP Guidelines – for preparing an Environmental Impact Assessment (EIA) report related to stratigraphic drilling offshore Greenland (2011)	• General public • Local authorities • Stakeholders	N/A	• Comments • Hearing process • Public hearing • Public hearing process • Public review
Guidelines for preparing an Environmental Impact Assessment (EIA) report for mineral exploitation in Greenland (2015)	• Authority • Citizens • Cultural heritage • Fishing • Hunting • Institutions • Local hunters and fishermen • Local industries • Local inhabitants • Local population • Greenland authorities • NGOs • Organisations • People • Public • Public concerns • Towns • Traditional users • Villages	• Local knowledge • Local use • Local use and local knowledge study • Scientific advisors • Scientific traditions	• Hearing meetings • Inclusion • Official consultations • Public consultation • Public hearings • Public information meeting • Public participation • Public pre-consultation
Offshore Seismic Surveys in Greenland: Guidelines to Best Environmental Practices, Environmental Impact Assessments and Environmental Mitigation Assessments (2015)	• Commercial fishery • Greenland subsistence hunt • Human activities • Fishing • Fishery • Fishing and hunting association • Hunt • Hunting • Public	• Scientific advisors • Scientific knowledge and understanding	• Comments from the public consultation • Comments from the public consultation meetings • Comments from the public pre-consultation • Consultation phase • Public consultation

			• Public consultation meetings • Public consultation period • Public pre-consultation • Written comments

Appendix B. Analysis of comments in Greenlandic white papers

This analysis is a detailed version of the rationale behind Table 1 in Paper 3: *the White Paper article*, where concluding remarks on this analysis can be found (*Appendix C*). Investigating the language used in the review of Greenlandic Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) reports sheds light on where and how Indigenous knowledge was used in these processes. Comments featured in white papers of EIA and SIA report reviews, given in both oral and written form during public hearings and public consultation meetings, were analysed by applying the Grounded Theory (GT) Method within the Constructivist strand of Informed GT (*see also Chapter 3.2*). This process involves identifying indicators of knowledge, practices, and traditions, as well as values and priorities reflecting Greenlandic Inuit culture, employing a focused coding process. The emerging categories and sub-categories were subjected to axial coding to find properties and dimensions, such as emerging topics, along with the groups submitting the comments, and issues covered. Notes were taken on whether and how the comments related to Indigenous knowledge. The following Tables B.1 to B.6 are detailed versions of Table 1 in Paper 2: *the White Paper article*, where the concluding remarks on this analysis can be found (*see Paper 3 in Appendix C*).

Table B.1: *Overview of the category of introductory comments in white papers of Greenlandic EIA/SIA report reviews.*

Category	**INTRODUCTORY**		
Sub-category	**N/A**		
Topics	**Groups**	**Issues**	**IK notes**
General statements without need for response	• Govt. agencies • NGOs • CSOs • Institutions • Individuals	• Introductions • Unspecific statements • Repetition / summary of report details	N/A

Table B.2: *Overview of the category of environmental comments in the technical, climate, and geological sub-categories in white papers of Greenlandic EIA/SIA report reviews.*

Category	**ENVIRONMENTAL**		
Sub-category	**TECHNICAL**		
Topics	**Groups**	**Issues**	**IK notes**
Pollution of environment	• Govt. agencies • Individuals • NGOs • CSOs	• Waste-handling • Pollution of water (chemicals, tailings, heat) • Pollution of land (chemicals, dust, noise, tailings) • Pollution of air (CO_2, SO_2, NO_X, BC, PM, SLCF) • Fuel types • CO_2 quotas	Not directly IK, but concerns indicate socio-cultural values on protection of environment
Alternative renewable energy sources, in particular hydropower	• Individuals • NGOs • CSOs • Institutions • Govt. agencies	• Hydropower • Solar power • Wind power • Concerns for total Greenland CO_2 emissions	Not directly IK, but concerns indicate preference for environmentally friendly solutions as part of socio-cultural values
Navigation	• Individuals • Institutions • NGOs • CSOs	• Ship ice classes • Ice navigation • Currents • Safety • Oil spill contingency plans • International guidelines	Not directly IK, but concerns indicate socio-cultural values on protection of environment
Long-term monitoring of pollution	• Individuals • NGOs • Govt. agencies	• Responsibility for monitoring • Costs of monitoring after closure	Not directly IK, but concerns indicate socio-cultural values on protection of environment
Suggestions to project design	• Individuals	• On-site sea ice conditions • On-site soil conditions	Related to IK on climate conditions
Sub-category	**CLIMATE**		

Topics	**Groups**	**Issues**	**IK notes**
Climate conditions, weather, seasonal changes	• Individuals • Govt. agencies	• Waves • Currents • Sea-ice • Seasonal muddy areas • Glacier melt & surge • Permafrost	Related to IK on climate conditions
Sub-category	**GEOLOGICAL**		
Topics	**Groups**	**Issues**	**IK notes**
Areas of special scientific interest	• Govt. agencies	• Geological sites	N/A

Table B.3: *Overview of the category of biological comments in white papers of Greenlandic EIA/SIA report reviews.*

Category	**BIOLOGICAL**		
Sub-category	**N/A**		
Topics	**Groups**	**Issues**	**IK notes**
Impacts on ecosystem, animals, and plants	• Individuals • NGOs • CSOs	• Directly (e.g. health, behaviour, migration, population) • Indirectly (hunting, gathering, invasive species in ballast water, feeding grounds/sources)	Related to IK on biological issues and traditional activities
(Cultural) prioritisation of important species	• Individuals • Govt. agencies	• Polar bears • Marine mammals • Reindeer • Eider ducks	Related to IK on biological issues and traditional activities
Project design suggestions	• Individuals	• Overlap with species (distribution, migration, feeding grounds)	Related to IK on biological issues

Table B.4: *Overview of the category of social comments in the economic, health, and cultural sub-categories in white papers of Greenlandic EIA/SIA report reviews.*

Category	**SOCIAL**		
Sub-category	**ECONOMICAL**		
Topics	**Groups**	**Issues**	**IK notes**
Employment	• Individuals • CSOs • Institutions • Govt. agencies	• Use of local workforce (experienced, unexperienced) • Subcontractors • Salaries, benefits, and working conditions • Unions	Related to IP rights
Conflicts on use of land/water	• Individuals	• Reduced hunting/fishing areas • Competing activities • Compensations/fund • Conflicts with stone collectors	Related to IK on land/water use and traditional activities
Benefits to Greenlandic society	• Individuals • CSOs	• Greenlandic subcontractors • Greenlandic workforce • Sale of local foods • Charitable investments in communities	
Capacity-building	• Individuals • CSOs • Govt. agencies • Institutions	• Education • Training • Internships • Language • Unemployment strategies	
Sub-category	**HEALTH**		
Topics	**Groups**	**Issues**	**IK notes**
Health issues	• Individuals • CSOs • Govt. agencies	• Pressure on local health systems • Contamination risks • Substance abuses • Sex-related issues (pregnancies, abortions, diseases)	

Sub-category	**CULTURAL**		
Topics	**Groups**	**Issues**	**IK notes**
Handling of cultural differences	• Individuals • Govt. agencies	• Differences in cultural values/norms between Greenlanders and company/outside workers • Cultural sensitivity training	Related to IK on cultural values and traditional activities
Historical / archaeological artefacts and sites	• Individuals • Institutions • Govt. agencies	• Historical reindeer hunting sites • Legislation on protection of cultural heritage • Destruction of graves (rumoured) • Training to recognise sites	Related to IK on historical and cultural sites

Table B.5: *Overview of the category of political comments in the strategic, process, and rights sub-categories in white papers of Greenlandic EIA/SIA report reviews.*

Category	**POLITICAL**		
Sub-category	**STRATEGIC**		
Topics	**Groups**	**Issues**	**IK notes**
Planning	• Govt. agencies • NGOs • Individuals • CSOs	• Infrastructure capacity (harbours, airports) • Building national energy infrastructure supporting mines • Zoning for different activities • National strategies for mineral resources	
Legislation	• NGOs • CSOs • Individuals • Govt. agencies	• National legislation and control • Legal status and strategic process for National Park • ILO C169 and UNDRIP • International agreements and obligations • Smuggling and criminality	Related to Indigenous Peoples' rights
Revenues	• CSOs • Individuals	• Taxes • Royalties • Public shares in companies • Local processing / value-creation	
Sub-category	**PROCESS**		
Topics	**Groups**	**Issues**	**IK notes**
Democracy issues (critique and suggestions for improvements)	• NGOs • CSOs • Individuals • Govt. agencies	• Public participation in more phases • Coverage of topics and details of report • Length of consultation periods • Overlap with other consultations	Related to Indigenous Peoples' rights

		• Increased transparency	
Sub-category	**RIGHTS**		
Topics	**Groups**	**Issues**	**IK notes**
Human rights and Indigenous Peoples' rights	• Individuals • CSOs	• Traditional collective ownership • Access to hunting, fishing, gathering, and stone collecting in areas overlapping with mining activities • National referendums on projects • Citizen rights • International agreements	Related to IK on customary traditional / cultural rights and socio-cultural values

Table B.6: *Overview of the category of information comments in white papers of Greenlandic EIA/SIA report reviews.*

Category	**INFORMATION**		
Sub-category	**N/A**		
Topics	**Groups**	**Issues**	**IK notes**
Corrections	• Individuals • NGOs • Govt. agencies	• Pinpointing wrong information • Updating to current information	Related to Indigenous Peoples' rights (right to access information to exercise FPIC)
Knowledge gaps	• Individuals • NGOs • Governmental agencies	• Pinpointing lack of information • Information requests • Critique of information • Cumulative impacts • Overall impacts of project over time	Related to Indigenous Peoples' rights (right to access information to exercise FPIC)
Critique of format and quality	• Individuals • NGOs • Govt. agencies	• Clarity of language • Quality of translations • Grammatical errors • Structural issues • Maps and figures resolution/information	Related to Indigenous Peoples' rights (right to access information to exercise FPIC)

Appendix C. Full papers

Table of contents

Paper 1: ***the Skills article***
Anne Merrild Hansen, Pelle Tejsner & Parnuna Egede (2016). Traditional Knowledge and Industrial Development: On the Potential Use of Indigenous and Local Knowledge as a Resource to Assess Competencies in Greenland **(Post-print version)** & Kleist et al. (2016). Sitting on Gold: A report on the use of informally acquired skills in Greenland **(Proof of figure 1, page 10)**

Paper 2: ***the Concept article***
Parnuna Petrina Egede Dahl & Anne Merrild Hansen (2019). Does Indigenous Knowledge Occur in and Influence Impact Assessment Reports? Exploring Consultation Remarks in Three Cases of Mining Projects in Greenland **(Proof)**

Paper 3: ***the White Paper article***
Parnuna Egede Dahl & Pelle Tejsner (2020). Review and Mapping of Indigenous Knowledge Concepts in the Arctic **(Version of Record)**

Paper 4: ***the Guidance note***
Sanne Vammen Larsen, Anne Merrild Hansen, Parnuna Egede Dahl & Alberto Huerta Morales (2019). Guidance Note on Indigenous and Local Community Participation in Environmental Impact Assessment in the European Arctic **(Post-print version)**

Paper 5: ***the Pikialasorsuaq essay***
Clive Tesar, Parnuna Egede Dahl & Claudio Aporta (2019). Picturing Pikialasorsuaq: Ethics & Effectiveness of Representing Inuit Knowledge in an Online Atlas **(Version of Record)**